THE IRON TRADE REVIEW

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GARY PLANT

WILL BE MAKING STEEL IN ABOUT ONE YEAR.

Blast Furnaces May be Finished Earlier.—Pig Iron Very Quiet, but Prices are Firm.—Chicago Jobbers Buy.

Strikes of about 1,100 laborers at Duluth and Two Harbors, Minn., have completely tied up navigation at these two ports, from which 3,400,000 tons of ore were shipped in June, and from which more than that would have been shipped this month, except for the strike. The laborers are not organized. They have a season contract, which the strike plainly violates, and many of them are anxious to return to work, but it is impossible to predict when the trouble will be adjusted. The wage scale of the bar iron manufacturers has not yet been agreed upon, but has been sent to the conciliation committee. Mills are gradually resuming after the shutdown for repairs, and will continue in operation at least until Aug. 10, awaiting the action of the conciliation committee.

Pig Iron Very Dull

The lethargy of the pig iron market continues, but little change in prices being noted. About the only sales in the east were a limited tonnage of Middlesbrough iron at low prices. Importing will cease next month unless unexpected demand should arise. Neither northern nor southern furnaces are disposed to coax buyers to place orders, as they are confident that many will be compelled to do so before the close of the year, and that the available supply will not exceed the demand.

Progress at Gary

July, 1908, will probably witness the making of the first steel at the Gary plant of the United States Steel Corporation. The blast furnaces will doubtless be ready for operation before that date, but it is unlikely that slips will be completed and other water transportation facilities will be in shape for profitable iron making until the steel works are ready. Excellent progress is being made on the colossal undertaking, work now going ahead simultaneously on eight blast furnaces and 56 open-hearth furnaces.

Jobbers Buying

The most important transactions in shapes and plates was the sale of about 30,000 tons to Chicago jobbers, and 7,000 tons of fabricated steel to the Northern Pacific railroad, making 20,000 tons taken by Hill roads this summer. Inquiries for a considerable tonnage of structural steel for barges and packet steamers are pending at Chicago, and many small orders of structural steel have been placed throughout the country. Deliveries are not being so promptly made.

Iron and Steel Bars

Sales of bar iron are limited and some western mills are showing indications of anxiety concerning orders. Specifications against steel bar contracts are heavy and new business is satisfactory. An order for 2,300 steel cars has been practically closed by the C., B. & Q. railroad, and other railroad inquiries are pending. Delivery of plates is more prompt, and independent interests which a few weeks ago were getting premiums of $6 per ton are now receiving only $2. Orders of rails and track material are limited, and some cutting of prices on nuts and bolts is reported.

Coke and Old Material

Owing to the extremely hot weather the supply of labor in the coke regions has been inadequate and production has been reduced. The demand for coke is very slack and prices are firm. Old material is dull and prices are receding in nearly all markets.

STRIKE THREATENS

TO CHECK GREAT ORE RECORDS ON MESABI RANGES.

Ore Trimmers Tie Up Docks, Demanding 25-Cent Increase.—Large Tonnage Handled in Past Week.

(Special Telegram.)

Duluth, Minn., July 17.—The aspect of the strike on the ore docks appears very serious this morning. While undoubtedly a large percentage of the men are willing to return to work, the lack of organization and the fear of violence prevent. About 400 men at the Two Harbors dock quit this morning, asking for the same pay as demanded on the Missabe docks. At Allouez, the men are working and show no disposition to quit. The Missabe railroad and docks have been absolutely idle since Monday and a number of the open-pit mines have been forced to suspend. Some relief was obtained through Two Harbors, but the strike ties up the range badly, particularly the Steel Corporation properties, but little of whose ore goes to Allouez. The railroads are decidedly firm in the position that the men have broken their agreement, a fact which is beyond dispute. They are making no effort at all to resume operations other than in giving the men opportunity to return at any time. It is believed that the men cannot hold out long. This year's wage scale is an advance of 15 cents over last year, and the customary fall increase was to be given, which was all the men asked in the spring. No further concessions will be offered.

(Special Correspondence.)

Duluth, July 15.—Another good week's work was experienced at the head of the lakes in the seven days just past and 1,129,413 tons were shipped from the three ports. The Missabe docks made their largest weekly shipment of the season and the Duluth & Iron Range docks at Two Harbors increased their output of a week ago by more than 80,000 tons. The docks at Allouez were seriously handicapped during the week by the severe wreck on the Great Northern, two ore trains colliding with a resulting loss of about 24 hours of traffic. With the exception of yesterday when

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THE WEEK IN IRON CENTERS

PITTSBURG.

Apprehension Caused by Dock Strike —Pig Iron Market Very Quiet.

Office of THE IRON TRADE REVIEW,
521 Park Bldg., July 17.

While half a dozen conditions combine to make the market situation in the Pittsburg district exceedingly quiet, there are others that have injected a feeling of disquiet, although no serious results are anticipated. The vacation period, semi-annual inventory, and the fact that buyers are, as a rule, pretty well covered for their requirements, all have a tendency to make things quiet. The biggest disturbing element in the situation is the strike of dock workers on the Missabe dock at Duluth. Already several vessels chartered for the season to carry ore consigned to valley and Pittsburg furnaces have been switched to other ports, and it is feared that if the strike is long drawn out, a scarcity of ore may result. The stocks of iron ore at furnace yards in the valleys are not large enough to enable operators to feel comfortable. One large interest stated on Tuesday that during June it was able to gain but 7,000 tons over consumption, and others are no better off.

The wage scale between the Amalgamated Association and the Republic Iron & Steel Co. is still unsettled, but the matter is now in the hands of the conciliation board, which will report by August 10. The Port Vue plant of the McKeesport Tin Plate Co. is experiencing strike troubles in its tin house because the management refused to sign the new scale of the Amalgamated. The hot mills department has been operating nonunion since the big strike a few years ago.

The most far reaching item of news during the week was the action of Judge Young of common pleas court in fining President B. F. Jones and directors of the Jones & Laughlin Steel Co. for contempt of court, and an order commanding the steel company to cease operating its five Eliza furnaces at the Soho plant unless the ore dust nuisance complained of by the residents of the Oakland district is abated. Every effort has been made to eliminate the nuisance, but the result has not been satisfactory to the court. Negotiations are now under way to rebuild the furnaces and install the Kennedy closed top. Should the appeal of the steel company to the supreme court not be effective and the restraining order remain in force, necessitating shutting down the furnaces, which have an estimated capacity of 1,000,000 tons of pig iron per year, the south side steel works of the company, which depend upon the furnaces for hot metal, will have to be closed. Already residents of Avalon in the vicinity of the Neville island furnace of the American Steel & Wire Co. are talking of court proceedings to restrain that furnace from emitting ore dust.

Mills shut down for the annual midsummer repairs and overhauling are gradually getting back into operation and the end of the week will probably see a majority of them again on their record-breaking grind to turn out material to meet the extremely heavy demand of consumers for shipments on old contracts. The very hot weather has cut down mill production to some extent, and the same condition is true of the coke region, where difficulty is being experienced in finding men to perform the work around the ovens.

New business has been light all along the line, with the single exception of steel bars. The tonnages of steel bars have individually been small, but the total has been good, and specifications are very heavy. The fact that the present time is between contract periods, as well as the well known bought up condition of most consumers is responsible, together with the vacation period and inventories, accounts for the lull in all branches of the business.

Buyers in all lines have not shown a tendency to cover at this time for far future deliveries, believing that there is nothing to be gained by placing their business now when there is a possibility of lower prices later in the year, and if this expectation is not realized they are confident that prices will at least be no higher.

Pig Iron.—Spot pig iron prices have almost entirely disappeared. The inquiry is very light and but very little iron is being offered. Despite the fact that premiums are no longer being asked, and iron for prompt shipment is from 50c to $1.50 lower on foundry grades than it was six weeks ago, the situation is strong and the available supply of iron tightly held. The quotations on spot Bessemer are nominal at best, and prices range from $23 to $23.50 valley. The only sizable inquiry in the market is from a western consumer who asks for 3,000 tons of Bessemer for last quarter, and upon which inquiry $23 has been quoted. There is little or no resale iron in the market since the Millikin Bros. basic has been disposed of. Notwithstanding the light buying, consumers are pressing merchant furnaces for shipments on old contracts, and in many cases furnaces have been asked to anticipate August and September iron, a practical impossibility at this time, as furnaces are sold up to full capacity, and in one or two cases considerably oversold and borrowing from other interests in order to meet contract requirements.

The consumption continues at an enormous rate. Northern No. 2 foundry is quoted $23 to $23.50 valley furnaces for both prompt and last half deliveries in the absence of sales which would establish a market. Gray forge iron is quoted $22 valley for shipment during the remainder of the year and basic $22.50 to $23. As far as can be learned, none of the large consumers of steel making iron has inquired for next year prices, and they are not expected in the market much before Sept. 1. On third quarter deliveries we quote as follows:

Bessemer, Valley	$23.00 to 23.25
Bessemer, Pittsburg	23.90 to 24.15
No. 1 Foundry, Pittsburg	24.90 to 25.40
No. 2 Foundry, Pittsburg	23.90 to 24.40
Gray Forge, Pittsburg	22.90 to 23.40
Basic, Valley	22.50 to 23.00
Basic, Pittsburg	23.40 to 23.90

Ferro-Manganese.—Very few transactions in alloys have been reported in this district during the week under review, and the inclination toward concessions brought about by a keener desire to sell than in the east is noted in this district. This is particularly true where large tonnages are concerned involving future deliveries. For prompt shipment, ferromanganese, foreign, 80 per cent, we quote $63 to $63.50 delivered Pittsburg, and for forward deliveries in large quantities, $60 Pittsburg, or $58 Baltimore.

Imported 50 per cent ferro-silicon is quoted $108 to $110 Pittsburg, domestic 12 per cent, $36; 11 per cent, $35; 10 per cent, $34. The lower grades of imported ferro-silicon are quoted $1 lower. These quotations are applicable to Pittsburg territory. Western and central western prices, where the material is not subject to the competition of foreign grades, are higher and in the east a little lower.

Steel.—The Youngstown plant of the Carnegie Steel Co. has been placed on billets and will probably run on them through the remainder of the

present quarter. This move was made necessary from the fact that the leading interest is behind in its deliveries on contracts, and also because the rail capacity is not in unusual demand. The Cambria Steel Co. has dropped out of the market as a seller of semi-finished steel. In connection with the long term contract between the Carnegie Steel Co. and the Pittsburg Steel Co., whereby the former supplies the latter for its requirements at the Monessen, Pa., plant, an interesting feature came to light during the past week. Instead of the Pittsburg Steel Co. notifying the Corporation of its desire to cancel the contract after July 1 next year, developments show that the Carnegie Steel Co. informed its independent competition that with the starting of the contemplated new steel plant at Monessen the Corporation desired to cancel its present contract. On soft Bessemer billets 4 x 4 and larger, we quote $30 to $30.50 Pittsburg, and on open-hearth, $31.50 to $32. Sheet bars are quoted nominally at $31 mill Pittsburg or Youngstown.

Plates.—The C., B. & Q. R. R. has practically closed with one of the large steel car companies of Pittsburg for 2,300 new steel freight cars, the plates and small shapes for which will aggregate between 25,000 and 30,000 tons. The Carnegie Steel Co. has closed for material for another ship on the lakes requiring 3,200 tons. The leading interest is practically out of the market on plates, and is not quoting on many of the inquiries being received. This is due to the inability to make shipments as requested by the buyer. The eastern plate mills are taking on most of this surplus miscellaneous business. We quote as follows:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.80c to 1.90c f. o. b. mill Pittsburg for prompt shipment, and 1.70c base Pittsburg on future deliveries. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c. A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3-16-inch plate on thin edges, 0.10c; under 3-16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Specifications have been light, but as the bulk of obligations of manufacturers are in specifications, this has helped them to some extent in catching up on their deliveries. The demand for galvanized roofing sheets is only fair, although the volume of business indicated that this year in tonnage will exceed any past record. The delivery promises on galvanized and blue annealed sheets are four months, and on light gage blue annealed and black sheets, six to eight weeks. The leading interest is utilizing every part of its equipment to help out the blue annealed situation. We quote:

Black steel sheets one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25; blue annealed, No. 10 and heavier, 1.85c; Nos. 11-12, 1.90c; Nos. 13-14, 1.95c; Nos. 15-16, 2.05c. Corrugated roofing, $1.90 per square for No. 28 painted, 2½-inch corrugation, and galvanized, $3.25 per square for No. 28.

Tin Plate.—While the volume of new business is not heavy, neither is it particularly slow, and it may justly be put into a normal class. Specifications are comparatively light. Can makers express the feeling that the present season, although it is from three to five weeks late, will at least be as good as last year. The leading interest is making reasonably prompt deliveries, and on black tin mill stock promised four to six weeks, and on coated stock six to eight weeks. We quote as follows:

Coke tin plate 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in ten days.

Rails and Track Material.—As far as the local rail interest is concerned, the new business taken on in the week has been practically nothing on standard sections. Nothing has been heard from the Pennsylvania railroad that would indicate its officials have changed their minds regarding the 1908 specifications. The local open capacity for standard sections during the remainder of the present year is estimated at a little over 200,000 tons, or about two months' run. The Steel Corporation will be making open-hearth rails at its Youngstown plant about July 1 next year. The demand for light rails has been very heavy. For 1907-08 deliveries under old specifications we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; standard spikes for forward deliveries, $2.30 to $2.35 Pittsburg; hand spikes, $2.50 Pittsburg.

Hoops, Bands and Cotton Ties.—This situation remains unchanged. There is no new buying except by the smaller concerns and this is at the full price, 2c in carload lots. Specifications are very heavy and requests for immediate delivery and deliveries earlier than original mill promises are numerous. We continue to quote:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c, base half extras as per standard steel. Cotton ties, 96c per bundle

Merchant Bars.—The fact that the Republic Iron & Steel Co. and the Amalgamated Association have not arrived at an agreement as to the 1907-08 scale has injected a little uncertainty into the future, but the matter is now in the hands of the conciliation board, composed of Ben I. Davis, representing the union, and Henry W. Heedy, of Youngstown, representing the Republic Iron & Steel Co., these to select a third member and together decide the wage question before Aug. 10. In the meantime all mills will operate under the old scale. Iron bars, from a selling standpoint during the past week, have been moving slowly. The market in the Pittsburg district is firm at the old prices, but there are indications of softening of conditions in the Chicago territory. Specifications against steel bar contracts are very heavy, with new contracts coming in every day, but the tonnages are comparatively small. We quote as follows:

Common iron bars, 1.75c to 1.80c Pittsburg in carload lots and over, 1.80c to 1.85c in less than carloads; 1.60c base Pittsburg, plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c, net for future deliveries; 1.85c to 1.90c out of stock; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained

on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30 advance. Cold rolled and ground shafting, 50 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

Structural Material.—Reports from both mills and fabricating shops are to the effect that there is a great deal of small inquiry, both from manufacturing establishments and architects, while no large tonnages are included in this inquiry. The new business is more satisfactory than it has been for some time past, and the increase has shown up in the volume of routine business. Railroad inquiry has constituted a major portion of new business in sight, and during the week the American Bridge Co. took on a contract for a bridge over the Maumee river at Dayton, O. Shape deliveries in some cases are slow because mills cannot make shipment on plate contracts accompanying them. We quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees, 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Wire and Wire Nails.—The demand for wire products at the present is heavier than during any July for the past half dozen years, although there has been a noticeable let-up in new business as compared with last month. This is due to the summer shut-downs, and the fact that it is between contract periods. We quote as follows:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carload, $2.30, with 30c for galvanizing; plain wire, $1.85 for jobbers, and $1.90 by carload.

Merchant Pipe.—The average run of ordinary small inquiry is being received, but there has been nothing unusual in the pipe market during the past week. Mills are hopelessly oversold for deliveries during the next three months. They are not particularly anxious to take on new business at this time, and are making no definite delivery promises. We quote the following official discounts to consumers in large lots, subject to one point and five to jobbers in large lots:

	—Steel— Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	70	55
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
DOUBLE EXTRA STRONG PLAIN ENDS.		
½ to 8 inches	54	43

Iron Pipe.—Manufacturers of iron pipe are filled up to the extent that they are not quoting on many inquiries and the only new business accepted is to take care of old customers. We quote:

RANDOM LENGTHS WITH THREADS AND COUPLINGS—CARLOAD LOTS.	Black.	Galv.
⅛, ¼ and ⅜ inch	59	43
½ inch	62	51
¾ and 6 inch	67	57
7 and 8 inch	62	46
PLUGGED AND REAMED.		
1 to 4 inch	65	55
EXTRA STRONG PLAIN ENDS.		
⅛, ¼ and ⅜ inch	52	40
½ to 4 inch, inc	59	47
4½ to 8 inch	55	42
DOUBLE EXTRA HEAVY PLAIN ENDS.		
½ to 3 inch, inc	48	37

Boiler Tubes.—Locomotive builders are coming in for their last half requirements and the business on this account is good. Specifications are very heavy against unfilled contracts. We quote:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Coke.—The coke market has been extremely quiet during the past week. The inquiry on both furnace and foundry grades has been light and the production in the region is considerably curtailed on account of scarcity of men due to the hot weather. It is known that some furnace interests have not covered for their last half requirements, but in the absence of any transactions upon which to base last half quotations we quote $2.50 to $2.60 at the ovens for last half furnace coke and $2.40 to $2.50 for spot furnace coke. On prompt 72 hour foundry coke we quote $3.15 to $3.25 and for the last half $3 to $3.15.

Old Material.—The scrap market is exceedingly quiet at this time. The mills are not buying and the only activity is between brokers who have material coming out on the contracts and have no open orders on which to apply it. These dealers are attempting to sell to other brokers who have open contracts as it is almost impossible to interest mills at this time. Prices are purely nominal, as there has not been enough business done to establish a market. For delivery in the Pittsburg district, gross tons, we quote as follows:

Heavy melting scrap, $18 to $18.50; re-rolling rails, $18.50 to $18.75; bundled sheet scrap, $16 to $16.50; iron axles, $31 to $31.50; old iron rails, $22.50 to $23; No. 1 wrought scrap, $18.50 to $18.75; old car wheels, $24 to $24.50; low phosphorus scrap, $23 to $23.50; machine shop turnings, $15 to $15.60; axle turnings, $15.50 to $15.75; cast borings, $13.50 to $14; No. 1 cast scrap, $21 to $21.50.

CHICAGO.

Heavy Sales of Shapes and Plates to Jobbers—Reselling of Pig Iron Weakens Market.

Office of THE IRON TRADE REVIEW.
1362 Monadnock Block, July 16.

The negotiations with local jobbers mentioned a week ago, have resulted in contracts for an aggregate of nearly 30,000 tons of structural shapes and plates. Not all the requirements of Chicago distributors are comprised in this tonnage, and additional contracts are expected to be closed in the near future. The requirements of the Hill roads in fabricated steel have been increased to 20,000 tons, of which 6,000 tons is for the Great Northern Railway, and 14,000 tons for the Northern Pacific. The latter is an increase of 7,000 tons above the original estimates. The entire tonnage has gone to the American Bridge Co., the Great Northern contract being let about a month ago. A large tonnage of structural steel is involved in inquiries for barges and packet steamers, mining and bridge work, as well as for office and factory buildings. No change is noted in other branches of the market. Pig iron continues dull, but is slightly more plastic under the pressure of buyers. Specifications for steel bars, plates, sheets, wire and tubular goods are to the capacity of mills. Bar iron is in light demand owing to the continued idleness of most of the middle western mills. The conciliation committee composed of representatives of the Amalgamated Association, the Republic Iron & Steel Co. and the Western Bar Iron Association will meet in a few days to settle the wage controversy for the ensuing year. Scrap shows no improvement in price, and trading is at a minimum.

Pig Iron.—Resale iron is cropping out more frequently than formerly, and offers at less than furnace quotations has had a tendency to soften the attitude of makers towards the future. The market has lost none of its inherent strength

though in view of the extreme dullness prevailing, with its element of uncertainty, it is possible under a firm offer to buy that quotations for the last half could be shaded to a greater degree than has been the case this year. Nominal prices are unchanged at $25 Chicago for northern No. 2 foundry, and $21.50 Birmingham for third quarter southern, and $20 Birmingham for fourth quarter. Resale iron for spot shipment has sold as low as $21 Birmingham. No furnace has met this price, but less than $21.50 can be done for third quarter, while a desirable order for deliveries running through the entire half could be placed at $20.50 Birmingham. Offers of small tonnage at $24.50 Chicago have been declined by local furnaces, but a round tonnage might receive a different reception. The market does not look permanently weak, and appearances indicate that with the passing of the holiday season a sharp improvement will occur. The melt of iron shows no diminution, and the pressure for deliveries is almost as keen as in the earlier months of the year. The maximum quotations on southern iron below are for third quarter; the minimum for fourth quarter:

Lake Superior Charcoal	$27.00 to 27.25
Northern Foundry No. 1	25.50 to 26.00
Northern Foundry No. 2	25.00 to 25.50
Northern Foundry No. 3	24.50 to 25.00
Northern Scotch Foundry	25.50 to 26.00
Southern Foundry No. 1	24.85 to 26.35
Southern Foundry No. 2	24.35 to 25.85
Southern Foundry No. 3	23.85 to 25.35
Southern Foundry No. 4	22.85 to 24.35
Southern No. 1 Soft	24.85 to 26.35
Southern No. 2 Soft	24.35 to 25.85
Southern Gray Forge	22.35 to 22.85
Southern Mottled	21.85 to 22.35
Southern Silveries, 4 per cent silicon	25.85 to 27.35
Southern Silveries, 5 per cent silicon	26.85 to 28.35
Southern Silveries, 6 per cent silicon	27.85 to 29.85
Jackson Co. Silveries, 6 per cent	29.40 to 29.90
Jackson Co. Silveries, 8 per cent	30.40 to 30.90
Jackson Co. Silveries, 10 per cent	31.40 to 31.90
Malleable Bessemer	25.00 to 25.50

Billets and Rods.—Conditions have not changed in the local market. Demand for crude steel is reasonably active, but is restricted largely to carload orders. Prices are without change at $31 Pittsburg for rolling billets; $37 to $38 Pittsburg for wire rods, and $36 to $38 Chicago for forging billets.

Merchant Bars.—The principal development of the week is the proposed joint meeting to discuss the wage scale for the coming year of representatives of the Western Bar Iron Association, the Republic Iron & Steel Co. and the Amalgamated Association. No date or place has been set for the meeting at the present writing, but this information will be made known as soon as all the delegates are appointed. This conciliation committee will be composed of five members, two representing the union, one the bar association, and another the Republic Iron & Steel Co. The four members will unite on the fifth. In the meantime, the plants of most of the interests affected remain closed down. New tonnage for either iron or steel bars is light. Specifications for steel are heavy, being to the full capacity of mills and up to contract requirements. No improvement is noted in old rail stock or shafting, quotations on which are irregular. We quote carload lots, Chicago delivery, as follows:

Bar iron, 1.78c to 1.83c; soft steel bars and bands, 1.78c half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base; iron finish, 1½ x 1½ inch and larger, 1.78c base; channels for solid rubber tire ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 2.08c; cutter shoe, 2.36½c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are irregular, 50 and 10 per cent off the list being offered on carload business, and 45 per cent in less than carload lots, base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.25c full extras; soft steel rounds, and square, 3-inch and larger, $2 per 100 base; flats, 2 inches to 4 inches by ⅛ inch and larger, $2 per 100 pounds base; 4½ inches by 5 inches and 6 inches by 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2 half extras; soft steel hoops, $2.50 full extras. Other sizes not mentioned above, $2 per 100 pounds base plus half extras.

Plates.—Specifications against existing contracts show no diminution. Makers everywhere are operating to capacity and shipping out the material as fast as it is made. New tonnage is restricted in volume because of the difficulty to secure satisfactory deliveries from the larger mills. Jobbers' operations are active, a large amount of business for prompt shipment being deflected to these channels. Prices are without change as follows:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.70c to 2c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch, 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.50c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—Specifications are good. New business is also coming forward in good volume. There is no disposition anywhere to shade prices, though from independent makers reasonably quick shipments can be secured without the payment of premiums. The leading interest is reported to be sold ahead 16 to 18 weeks on black sheets, and 20 weeks on galvanized. Jobbers are doing an active business, though having difficulty maintaining a full line of galvanized sheets. Prices are without change as follows:

Black sheets, Nos. 8, 9, and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets, No. 28, 3.75c Pittsburg. Freight to Chicago, 18c per 100 pounds for carload lots, and 20c for less than carload lots. Jobbers' prices on carload lots and less from store are as follows:

No. 10, 2.50c to 2.55c; No. 12, 2.55c to 2.60c; No. 14, 2.60c to 2.65c; No. 16, 2.70c to 2.80c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3.05c to 3.15c; No. 30, 3.35c to 3.45c. Galvanized sheets, No. 10 to 20, 3.50c to 3.55c; Nos. 22 and 24, 3.65c to 3.75c; No. 26, 3.85c to 3.90c; No. 27, 4.05c to 4.15c; No. 28, 4.25c to 4.35c; No. 30, 5.40c to 5.45c.

Structural Steel.—Contracts aggregating over 20,000 tons have been placed with mills within the past few days by a local jobbing interest. Other orders from a similar source, totaling a round tonnage, are still pending. In fabricated material, the principal order of the week is for 7,000 tons placed by the Northern Pacific with the American Bridge Co. Including the 6,000 tons bought by the Great Northern a few weeks ago, and the 7,000-ton specification received from the Northern Pacific about the same time, the aggregate orders from the Hill roads this spring reach 20,000 tons. The American Bridge Co. reports a good inquiry for barges and river steamer hulls. The company is now figuring on four hulls, of 1,100 tons apiece, for a packet line to operate between St. Louis and Kansas City; for two car ferries, of 1,000 tons apiece for the 'Frisco railway, and for a barge requiring 800 tons of steel, for the Louisiana Railway & Navigation Co. The contract for Fort Snelling (Minn.) which will require about 2,000 tons of steel, will be let

on the 19th. The Copper and Queen mine, Arizona, is in the market for a smelter building, 1,000 tons, and the Doe Run Lead Co., Missouri, for an engine house of 500 tons. The number of small jobs is unusually large. We quote mill material, as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from Pittsburg to Chicago, 18c per 100 pounds for carload lots, and 20c per 100 pounds for less than carload lots. Quotations from store are as follows:

All angles, three inches and larger, including six inches, $2.10 per 100 pounds; angles, over six inches, $2.15 per 100 pounds base; beams, 3 to 15 inches inclusive, $2.10 per 100 pounds base; channels, three inches and larger, $2.10 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—Railroads continue light buyers of standard sections, no contracts of interesting proportions being placed with the local mill in the past week. Light rails are active, one mill securing an order for 1,000 tons. Quotations on bolts and nuts show some variation. We quote without change as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $35; 25-pound, $36; 20-pound, $37; 16-pound, $38; 12-pound, $39, and lighter sections down to 8-pound, $45.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote f. o. b. Joliet: Angle bars, 1.65c; spikes, 2.25c; bolts with square nuts, 2.65c; with hexagon nuts, 2.80c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.40c to 2.50c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Cast Iron Pipe.—The two most important contracts closed in the week under review are 500 tons for the Mattoon Water Works, Mattoon, Ill., and 500 tons for the Steel Corporation's mining properties at Coleraine, Minn. Both went to the United States Cast Iron Pipe & Foundry Co. The inquiry for 2,500 tons for Columbus, O., is still pending. Prices are without change, as follows: Four-inch water pipe, $38.60; 6 to 12-inch, inclusive, $37.60; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—No cessation in demand for tubular goods is noted. Mill conditions also are without change. Deliveries are very slow, and it is impossible to state when they will be overtaken. Jobbers are doing a very satisfactory business and securing stiff prices for guaranteed shipments. We quote mill discounts, Chicago delivery, carload lots, as follows: (On steel pipe jobbers are allowed a concession of one point and five per cent additional from the schedule in force.)

MERCHANT PIPE.

	—Steel— Black.	Galv.
¼ to 6 inches, inclusive.....	71.2	61.2

BOILER TUBES.

	Steel.	Iron.
2¼ to 5 inches, inclusive....	62.2	49.2

Mill quotations on iron pipe are from four to five points higher than above. A concession of one point from the following quotations is allowed by Chicago jobbers on carload orders for shipment from local warehouse stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch.....	60	44
⅜ inch	62	48
½ inch	64	57
¾ to 6 inches.....	68	58
7 to 12 inches.....	64	49

Minimum prices for wrought iron pipe, carload lots or greater, from Chicago stocks, are as follows: ⅛ inch to ¼ inch, 55; ⅜ inch, 57; ½ inch, 59; ¾ inch to six inches, 64; 7 inches to 12 inches, 59. Boiler tubes from store are unchanged at 60 off for steel; 47½ for iron, and 42½ for seamless, base sizes, 2¼ inches to 5 inches.

Wire Products.—Shipments of agricultural material are going forward to the full capacity of mills. Despite the summer season, jobbers are not letting up on their pressure for deliveries, and makers have been unable to accumulate any stocks. Smooth wire for the manufacturing trade is very active, and deliveries of this product are slower than on others. Quotations to jobbers are without change, as follows:

Wire nails, $2.18; painted barb wire, $2.33; galvanized barb wire, $2.63; smooth annealed wire, $2.03; smooth galvanized wire, $2.33; polished staples, $2.28; galvanized staples, $2.58. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—The market continues quiet and prices are soft. Spot Connellsville foundry coke is held at $3 to $3.25 ovens, and at $3.15 to $3.30 for extended deliveries. Spot furnace is quoted at $2.35 to $2.50 and for the last half from $2.50 to $2.60.

Old Material.—It is stated that a round portion of the 17,000 tons of scrap offered in railroad lists a week ago had to be withdrawn because of the low prices quoted and light bidding generally. The market is very soft and little trading is done. Buyers can almost name their own prices, so anxious are dealers to convert a portion of their holdings into ready cash. "Pick-up" business forms the bulk of transactions, and these wants are shopped around before finally placed. Some inquiry has been received from Pittsburg for heavy melting stock the purchase of which at current prices is now attractive to these interests. There is a marked absence of any large requirements in the local market, however. We have revised our prices, as follows, quoting gross in the first paragraph as follows:

Old Car Wheels.....	23.75 to 24.25
Old Iron Rails.....	22.50 to 23.00
Re-rolling Rails (3 ft. and over).	18.00 to 18.25
Old Steel Rails (3 ft. and under)	17.75 to 18.25
Light Section Relayers, 45 lbs. and under, subject to inspection...	**30.00 to 32.00**
Relaying Rails, subject to inspection	**28.00 to 30.00**
Frogs, Switches, and Guards....	16.00 to 16.50
Heavy Melting Steel.....	15.50 to 16.00

We quote net tons as follows:

No. 1 R. R. Wrought.....	$14.75 to 15.25
No. 2 R. R. Wrought.....	13.75 to 14.25
Knuckles, Couplers and Springs.	15.50 to 16.00
Shafting	17.50 to 18.00
Dealers' Forge No. 1.....	12.75 to 13.25
Pipes and Flues.....	11.50 to 12.00
No. 1 Cast, 150 lbs. and less...	18.25 to 18.75
No. 1 Mill	10.25 to 10.75
Mixed Busheling (Nos. 1 and 2)	11.00 to 11.50
Country sheet	8.50 to 9.00
No. 1 Boiler Cut.....	11.00 to 11.50
Boiler Punchings	14.50 to 15.00
Cast Borings	9.75 to 10.25
Mixed Borings, etc.....	9.75 to 10.25
Machine Shop Turnings.....	11.25 to 11.75
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	15.50 to 15.75
Stove Plate and Light Cast Scrap	15.00 to 15.50
Old Iron Splice Bars.....	17.50 to 18.00

CLEVELAND.

Strike Retards Ore Shipments.—Price Cutting on Bolts and Nuts.

Office of THE IRON TRADE REVIEW,
Browning Building, July 17.

Iron Ore.—Shipments of ore for the first half of July were in excess of those for the first half of June, and the outlook was favorable for a new high record for the month, but on Monday, five or six hundred laborers on the dock of the Duluth, Missabe & Northern Railway Co., at Duluth, in direct violation of their contract for the season, went on strike for an increase of wages and work at the dock has been temporarily suspended. The minority of the men are in favor of returning to work, but it is impossible to predict when the strike will end.

Ore buyers this year are unusually careful in accepting ore, and in some cases threats of cancellation have been made when the ore has not come up to guarantee. This condition is due to a large extent to the fact that large ore shipments have indicated an ample supply for all consumers. If,

by reason of strike or other causes, shipments should be curtailed, buyers would probably not be so rigid in insisting upon adherence to guarantee.

Pig Iron.—Another week of extreme quiet has passed. For prompt delivery iron can now be had at $23 for No. 2. Very little interest is shown in iron for next year's delivery. We quote, f. o. b. Cleveland, as follows, the higher quotation being for third quarter delivery and the lower for fourth quarter:

Bessemer	$23.90 to 24.25
No. 1 Foundry	23.50 to 24.00
No. 2 Foundry	23.00 to 23.50
No. 3 Foundry	22.50 to 23.00
No. 2 Southern	23.85 to 24.85
Gray Forge	22.00 to 22.25

Coke.—There is very little activity, but prices seem to be somewhat firmer. For last half delivery, furnace coke is selling at $2.25 to $2.50, and foundry coke at $3 to $3.50.

Finished Material.—Inquiries for 5,000 to 7,000 tons of steel rails for traction interests are pending. The outlook is that the enterprise will be successfully financed and the order placed. A considerable demand for steel ties for use in mines is developing, as it is found that steel ties can be taken up and relaid much more satisfactorily than wooden ties. The demand for nuts and bolts is not so active and some cutting of prices is reported. The demand for spikes is also rather slack. Independent interests are not giving as good deliveries on structural material as was done a few weeks ago. Shafting prices show considerable irregularity. Some of the western mills are very anxious about orders for bar iron. The Republic mills have resumed and are well supplied with orders. Some mills are still obtaining premiums for prompt delivery of plates, but the maximum price appears to be 1.80c Pittsburg, instead of 1.90c, which recently prevailed.

Considerable complaint is heard among jobbers of slow collections. The financial problem how to obtain enough money to keep up with the demands for production is one of growing importance in this district.

Old Material.—The market presents a continuation of the extremely quiet conditions of the past few weeks with further declines in some grades, particularly in cast scrap. There appears to be a plentiful supply of all grades to be had, but dealers are not closing any large tonnages because of the unwillingness of the mills to buy for the future at this season of the year. The sale of a considerable tonnage of boiler plate at the top price of $14.50 is noted. Local dealers have received a good sized tonnage from the heavy railroad lists of the Pennsylvania lines east, B. & O., Norfolk & Western and Southern railways, which were closed this week. The prices received by the railroads are somewhat lower than those of last month. We have revised our prices, and quote, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	$23.00 to 24.00
Old steel rails (re-rolling)	17.75 to 18.75
Old steel rails (under 6 feet)	17.50 to 18.50
Old car wheels	23.00 to 24.00
Steel boiler plate	14.00 to 14.50
Steel axles	22.00 to 23.00
Malleable iron (railroad)	18.75 to 19.25
Malleable iron (agricultural)	16 50 to 17.00
Heavy steel	16.25 to 16.75
Country mixed steel	15.25 to 15.75
Low Phosphorus	21.50 to 22.50

We quote net tons as follows:

No. 1 R. R. wrought	$16.50 to 17.00
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	18.50 to 19.50
Iron axles	25.00 to 26.00
Axle turnings	13.50 to 14.00
Machine shop turnings	12.25 to 12.75
Grate bars	14.50 to 15.00
Pipes and flues	14.00 to 14.50
Tank iron	12.50 to 13.50
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.50
Wrought drillings	12.25 to 12.75
Stove plate	14.50 to 15.00
Cast borings	10.75 to 11.25

CINCINNATI.

Pig Iron Continues Dull—Some Resale Iron is Being Disposed of.

Office of THE IRON TRADE REVIEW,
124 Government Place, July 16.

Pig Iron.—The market is dull. There is but little inquiry and this is mostly for spot iron. Forward business is nil. Two fairly large consumers are in the market for spot iron and have bought some on the basis of $20.50 Birmingham for No. 2 foundry. A little No. 4 foundry has sold at about $18.00 Birmingham. It is reported that the leading interest in cast iron pipe has bought a few lots here and there, but no large tonnage has been taken. Gray forge is easy and has been quoted at $17.25 to $17.50 Birmingham. There is only an occasional car of northern spot coming out. Quotations for prompt delivery delivered Cincinnati are as follows:

Southern Foundry No. 1	$24.25 to 24.75
Southern Foundry No. 2	23.75 to 24.25
Southern Foundry No. 3	23.25 to 23.75
Southern Foundry No. 4	21.25 to 21.75
Southern No. 1 Soft	24.25 to 24.75
Southern No. 2 Soft	23.75 to 24.25
Southern gray forge	20.50 to 21.00
Northern No. 1 foundry	25.70 to 26.20
Northern No. 2 foundry	25.20 to 25.70
Northern No. 3 foundry	24.70 to 25.20

There is not enough inquiry to test prices for forward deliveries, but the feeling is rather easy and any reasonable, firm offer is submitted. Prices are largely nominal under such a situation and we regard quotations as the same as one week ago. Southern furnaces are not urging their offerings and it is not clear that there is any large tonnage to be sold for this year. Some resale iron is being placed in the hands of commission houses for disposition, but there is only a moderate amount of this and it seems to be worked off without much difficulty. The leading producers in the Birmingham district are, so far as can be learned, holding their schedules. For next year's delivery southern brands are generally held at $18.50 Birmingham, but that $18.00 can be done seems to be freely admitted. We quote for fourth quarter delivery delivered Cincinnati as follows:

Southern Foundry No. 1	$22.75 to 23.25
Southern Foundry No. 2	22.25 to 22.75
Southern Foundry No. 3	21.75 to 22.25
Southern Foundry No. 4	21.25 to 21.75
Southern Foundry No. 1 Soft	22.75 to 23.25
Southern Foundry No. 2 Soft	22.25 to 22.75
Gray Forge	20.25 to 20.75
Northern Foundry No. 1	23.70 to 24.20
Northern Foundry No. 2	23.20 to 23.70
Northern Foundry No. 3	22.70 to 23.20

Finished Material.—There is still a fairly good retailing demand and prices are well maintained. On some descriptions there is a tendency to catch up on deliveries, but this is not general. Small orders are filled here at the following prices:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, 2.00c base; boiler tubes, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—There is a firmer feeling on the part of makers of standard brands, and they are holding their quotations in a strong manner. There are some smaller operations, however, which are eager for business and are inclined to take business at concessions. The spot coke market is very irregular and easy with some rather low prices being made. Quotations in the leading coke producing districts are as folllows:

Wise County, Va., Furnace Coke, prompt shipment	$2.40 to 2.50 per ton
Wise County, Va., Foundry Coke	3.00 to 3.10 per ton
Pocahontas Furnace Coke, prompt shipment	2.50 to 2.75 per ton
Pocahontas Foundry Coke	3.00 to 3.25 per ton
Connellsville Furnace Coke, prompt shipment	2.40 to 2.65 per ton
Connellsville Foundry Coke	2.90 to 3.50 per ton
New River Foundry Coke, prompt shipment	3.00 to 3.50 per ton
New River Furnace Coke, contract	2.65 to 2.75 per ton

Old Material.—The demand continues light and the market rules dull and easy with some quotations slightly lower. We quote f. o. b. Cincinnati as follows:

Old No. 1 R. R. wrought net tons	$17.00 to 17.50
Cast machine and f'dy, net tons	19.00 to 19.50
Old iron rails, gross tons	24.00 to 25.00
Old steel rails, gross tons	18.00 to 19.00
Old short lengths, gross tons	18.00 to 19.00
Old iron axles, net tons	26.50 to 27.00
Heavy melting scrap, gross tons	21.00 to 22.00
Stove plate, net tons	15.00 to 15.50
Wrought turnings, net tons	13.00 to 13.50
Cast borings, net tons	11.00 to 11.50
Car wheels, gross tons	23.50 to 24.50

PHILADELPHIA.

Tendency Toward Lower Pig Iron Prices.—Scrap Dull and Weak.

July 16.

Pig Iron.—Midsummer dullness rules the market, which continues easy without being weak. Sales have been comparatively few, making exact quotations difficult, but, such as they are, they show a tendency to a slightly lower level. No anxiety is felt by producers over this fact because they know that there are a number of factors working against any sweeping reduction. Among these are the necessities of many consumers who have not yet covered their requirements for September and the last quarter, and whose purchases cannot be much longer delayed; the elimination of the supplies of English iron, the importing of which will cease next month, and the probability that any further reduction in prices will put out of business a number of old-fashioned furnaces which can be operated profitably only when prices are high and which are now approaching the danger line. The falling off in production due to the last two causes will more than counterbalance the increased capacity due to the coming in of new furnaces. English iron is quoted at from $20.50 to $21 on dock and is not in much demand. Consumers are taking all the iron they have ordered, and there are some requests received for the first quarter of 1908, but the prices offered are low, as a rule, and producers are holding off until the situation becomes a little clearer. Prices for the present quarter may be quoted as follows:

No. 1X Foundry	24.00 to 24.50
No. 2X Foundry	23.50 to 24.00
No. 2 Plain	22.50 to 23.00
Standard Gray Forge	22.00 to 22.50
Basic	23.00 to 23.50
Low Phosphorus	27.50 to 28.00

Finished Material.—In view of the fact that this is the very heart of the summer, when many mills expect to close down for more or less protracted periods, orders are holding up remarkably well, with a good deal of new business in sight in the near future. This applies to nearly all branches. Prices, which show no change, may be quoted as follows: Beams, channels and angles, according to specifications, 1.85c to 1.90c; refined iron bars, 1.80c to 1.90c; steel bars, 1.75c to 1.85c; plates, 1.85c to 1.90c.

Old Material.—Scrap is dull and weak, and prices seem to be still on the sliding board because of the mills' disinclination to place orders until they consider that the bottom has been reached. For the present the following quotations may be given:

Old steel rails	$19.00 to 19.50
No. 1 steel scrap	18.00 to 18.50
Old steel axles	21.50 to 22.00
Old iron axles	29.00 to 30.00
Old iron rails	25.50 to 26.00
Old car wheels	23.50 to 24.00
Choice scrap R. R. No. 1 wrought	20.00 to 20.50
No. 1 yard scrap	17.50 to 18.00
Machinery scrap	20.00 to 20.50
Low phosphorus scrap	23.00 to 23.50
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	16.00 to 16.50
No. 2 forge fire scrap, ordinary	11.50 to 12.00
Wrought turnings	15.50 to 16.00
Axle turnings, heavy	16.50 to 17.00
Cast borings	14.50 to 15.00
Stove plates	16.50 to 17.00

NEW YORK.

Few Sales of Pig Iron.—Small Premiums for Plates for Prompt Shipment.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., July 16.

Pig Iron.—The market has apparently settled into a dormant condition which is likely to prevail throughout the summer. In this district the past week has witnessed almost no new business of consequence other than the sale of between 700 and 1,000 tons of No. 3 Middlesbrough iron, which went chiefly to tidewater consumers. This represents the tonnage unsold out of two cargoes which reached this port recently and reports are that a part was disposed of at extremely low prices, though the average for the lot was very fair, considering that it was practically a forced sale. British reports are that Germany is still active in purchasing, while new engagements for American account are at an end. The level of the market is slightly lower, the week opening at 57s 3d. Business in domestic iron is confined to car lots and smaller, but the price is holding up in a surprising manner. Furnaces are not manifesting any eagerness for orders and insist that by the end of six weeks consumers will be forced into the market again, with the result that even a moderate demand, in view of the small tonnage of iron to be had through the third quarter, will again restore the vigorous conditions of the spring and early summer. Occasional sales at shaded prices are reported, but on investigation they usually turn out to involve off iron for which the demand is not now active. Quotations, largely nominal, are on the following level, tidewater:

Northern Foundry No. 1	$24.00 to 25.00
No. 2X Foundry	23.50 to 24.50
No. 2 Plain	23.00 to 24.00
No. 2 Southern Foundry	23.50 to 25.50
Basic	23.00 to 24.00

Ferro-Manganese.—The demand is light, though occasionally an inquiry of size develops. For forward delivery, 80 per cent, $60.50 to $61.50 represents the tidewater market, with prompt shipment slightly higher.

Finished Material.—No important lettings of structural materials are announced, though a considerable tonnage is involved in contracts pending and in work on which tenders will shortly close. In the latter class, the most conspicuous is the filling of requirements for the city pier sheds on piers 54 and 56, about 7,000 tons, on which bids will close July 19. The New Haven is in the market for steel for a large lift bridge at Providence which will require between 1,000 and 1,500 tons. The Edison power station award has not yet been announced. It is understood that the contract for the steel which will enter into the Northern Pacific railway bridges, about 14,000 tons, will be furnished by the American Bridge Co. Bids have closed on the 15,000 tons of steel rails for the Imperial railway of Japan, but it will probably be some time before the contract is closed, as the letting will be made at the home office. A Louisiana lumber company is in the market for 2,000 tons of standard sections. Outside of the usual run of small orders, largely for railway purposes, the cast iron pipe market is without incident.

Plates are quiet, though prompt shipments still command a slight premium. The current demand is chiefly for universal plates for construction purposes, in part the result of the Milliken suspension. Bar iron is inactive, with only an occasional deal of consequence. The association is to meet Thursday of this week and will probably reaffirm prices. We quote: Angles, 3 to 6 inches x ¼ inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼ and heavier, 1.91c; plates, carloads, tank, 1.96c; marine boiler, 2.26c; bar iron, 1.86c; soft steel bars, 1.76c; sheets, No. 28, black, 2.60c.

Old Material.—Midsummer weather and the unsettled condition of labor in the east have combined with the general lessening of activities to force scrap to lower levels and the past

week has seen a sharp break in several lines, notably heavy melting steel, wrought pipe, borings, turnings, cast scrap, stove plate and grate bars. The situation, except for price changes, remains much the same. We quote New York delivery, gross tons, as follows:

Old iron rails	$24.50 to 25.50
Old steel rails, rerolling	18.00 to 18.50
Relaying rails	27.00 to 28.00
Old car wheels	23.50 to 24.00
Old iron car axles	28.50 to 29.50
Old steel car axles	21.00 to 21.50
Heavy melting steel	15.00 to 15.50
No. 1 railroad wrought	17.50 to 18.00
Iron track scrap	17.00 to 17.50
Wrought pipe	13.50 to 14.00
Cast borings	12.50 to 13.00
Wrought turnings	13.50 to 14.00
Heavy cast scrap	17.00 to 17.50
Railroad malleable	16.50 to 17.00
Agricultural malleable	15.00 to 16.00
Stove plate	15.00 to 15.50
Grate bars	14.00 to 14.50

BUFFALO.

Conditions Easier With Confidence Concerning the Future.

July 16.

Pig Iron.—Furnace men express a good deal of confidence in the market and while a marked dullness, characteristic of the summer season, prevails in this district, conditions give a strong tone to the market and indicate firm quotations. Foundries, in many cases, are working light to give opportunity for repairs and improvements which would be made with difficulty during any other season of the year. For this reason the consumption is much less than the output and furnaces are fast catching up with deliveries. In some instances, the furnaces are running even with contracts calling for deliveries at this time.

There is no shortage of spot iron here this week. Under ordinary conditions the supply would not satisfy the demand, but there are sufficient offerings of spot to permit sales at schedule prices, no premium being asked. The spot market has been gradually drifting into this condition and prompt iron is likely to be found at moderate prices the balance of the year.

In the foundries a prosperous condition throughout this district is generally reported. Foundrymen see plenty of business for the future and express satisfaction at prevailing conditions.

For last quarter deliveries we quote as follows:

No. 1X Foundry	$23.75 to 24.00
No. 2X Foundry	23.00 to 23.50
No. 2 Plain	22.50 to 23.00
No. 3 Foundry	22.75 to 23.00
Malleable Bessemer	23.00 to 23.50
Gray Forge	22.00 to 22.50
Charcoal	27.00 to 27.50

ST. LOUIS.

Slightly Increased Inquiry.—No Important Changes in Prices.

July 15.

Pig Iron.—Inquiries for pig iron have increased over those of the previous week, and while the prices are low, the demand is not sufficient to make any material change in conditions. A few buyers are still compelled to cover their demands for the third quarter, and it is expected that requirements will take care of what surplus iron is produced. There is one inquiry out for 5,000 tons of basic for shipment beginning Sept. 1., and continuing throughout the year. Our prices, f. o. b. Birmingham, for immediate shipment, to which the freight of $3.75 is to be added, follow:

No. 1 Southern	$22.00 to 22.50
No. 2 Southern	21.50 to 22.00
No. 3 Southern	21.00 to 21.50
No. 4 Southern	20.50 to 21.00

Coke.—The market is on the upward trend, and prices are stiff at $3.25 to $3.50 for 72-hour Connellsville, f. o. b. ovens. The freight to East St. Louis is $2.80, and to St. Louis, $2.90.

Steel.—There is a little increase in the demand for structural steel. A contract was let last week in Kansas City, Mo., for the Jones Dry Goods Co.'s new building for about 1,100 tons, to the Kansas City Structural Steel Co., with works in Argentine, Kas. Light rails are in good demand, also bars and bands. Customers are pressing hard for delivery of the two latter commodities. The demand is still light for standard rails for 1908 delivery.

Old Material.—The market is dull, with no changes in prices since last week. Dealers in St. Louis do not anticipate any marked improvement, until the mills reopen in September. Our quotations, f. o. b. St. Louis, follow:

	GROSS TONS
Second-hand Relaying Rails, according to time of delivery	$29.00 to 32.00
Steel rails (less than 3 feet)	16.00
Car wheels	24.00
Iron rails	24.50
Re-rolling steel rails	17.00
Heavy melting steel	16.50
Country steel mixed	15.00
	NET TONS
No. 1 R. R. wrought	$16.50
No. 2 R. R. Wrought	15.00
Iron splice bars and fish plates	19.00
Iron car axles	24.00
Steel car axles	19.50
Locomotive tires, smooth inside	15.00
Iron shaftings (3 to 6 inches)	18.00
Country wrought	15.00
Pipes and flues	13.00
Heavy machinery	17.50
R. R. cast (less than 300 pounds)	17.00
No. 1 Busheling	14.00
No. 2 Busheling	13.50
Boiler sheet and rings	13.00
R. R. cast borings (free of inferior quality)	10.00
R. R. wrought turnings	13.50
Machine shop turnings (free from brass)	11.00
Railroad malleable	16.50
Agricultural malleable	15.00
Cast stove plate	14.00

BIRMINGHAM, ALA.

Furnaces Banked on Account of Ore Shortage—Mines are Leased.

July 15.

Alabama furnace companies are making all efforts to catch up in their deliveries. According to common reports, some of the companies are two or three weeks and even longer behind in their deliveries. The production during the past week suffered some through a short supply of ore, the Tennessee Coal, Iron & Railroad Co. having three furnaces with banked fires for more than half of the week, while other furnaces had to run slack for a while. Since July 4, the ore mines have been running short, many of the laborers not returning to work. Some few sales of iron for delivery during the fourth quarter of the year are still being made. The quotations continue strong, $21 and $21.50 per ton, No. 2 foundry, being commanded for the product, delivery during the latter part of this year. Some little iron sells yet for delivery during the first half of the coming year, the product being sold on the basis of $18.50 per ton, No. 2 foundry. What little iron is to be seen on furnace yards in this district does not belong to the producers. It is being held awaiting instructions as to shipment. Preparations are being made for an increased output of ore. The Tennessee company has leased the ore mines at Champion, in Blount county, and will operate them just as soon as machinery can be placed and other arrangements made. The property is very valuable, the ore being rich. The property is owned jointly by the Tennessee and Sloss-Sheffield companies and has not been worked for nearly a dozen years because of a disagreement among the owners. It is expected that within 90 days the two mines can be put in operation and a large supply of ore be secured.

BRITISH IRON MARKET

Pig Iron Strong in Spite of Decrease in American Demands.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., July 8.

There has been some little recovery of prices during the past week, and in spite of a great falling off in foreign buying, a good deal of firmness has been maintained. This has tended to allay the panic caused for a time by weaker American advices. To-day's quotation is 56s ($13.70) which is a slight falling off from the figure realized on Friday, but the prices keep fairly steady. Yesterday's market was quiet, but there is less disposition to realize than of late. The June shipments reached the phenomenal figure of 172,000 tons, with a reduction in

warrant stocks of 50,000 tons. During the second quarter of the year 186,000 tons of pig-iron were taken from the warrant store. There is still a good deal of iron to go to America, even if no further purchases take place. But the general impression is that the fall of 7 shillings, which has taken place in 24 days, will encourage business, especially now that steadiness has been realized. There is every prospect of a good continental demand and Germans are buying practically all the time. There is much scarcity of hematite, stocks in the Furness district having fallen from 70,000 tons to 25,000 tons. In the Midland district, prices keep generally firm, but Northamptonshire and Derbyshire irons have in some cases given way, certain dealers making slight concessions in response to the weaker influences of Cleveland. But in view of arrears of delivery and the heavy nature of existing contracts, substantial concessions are extremely unlikely.

METAL MARKET.

NEW YORK.

July 16.

Copper.—Following the official reduction in the leading interests' quotations, announced a week ago, there has been a further decline, with the result that "official" prices are still somewhat above the actual basis of sales. Not a great deal of business has resulted from the developments of last week and there is still considerable pressure to sell, but the situation is entirely favorable to the consumer and a heavy movement can be expected shortly. Actual prices range as follows: Lake, 21¾c to 22¼c; electrolytic, 21¼c to 21¾c; casting 20¼c to 21c. There has been a sharp break in the British market, yesterday's close being at £93 5s for spot, and £88 for futures.

Pig Tin.—The week has witnessed the complete collapse of the upward movement abroad, and backward actions of futures have been largely wiped away. Yesterday's close on the London market was £185 10s for spot and £181 10s for futures. The local market is weak and hesitating, with prices ranging from 41c for spot to 40c for August shipment and lower figures on later delivery.

Pig Lead.—There is little change in the market, which is dull and exceedingly easy in tone. Quotations are about 5.25c, spot delivery, New York; 5.15c futures; 5.17½c spot, St. Louis; soft Spanish at London £20 15s.

Spelter.—Buyers are inclined to be conservative, largely because of frequent reports that western smelting works are accumulating stocks. At New York current prices range between 6.15c and 6.20c, at St. Louis, 6.00c to 6.05c.

Antimony.—The tone is slightly stronger, but the market is still quiet and featureless, with prices about as follows: 13c to 13½c; Hallett's, 10¾c to 11¼c; ordinary brands, 10¼c to 10¾c.

CHICAGO.

July 15.

Decided weakness was evinced in the local metal market and heavy drops occurred in the prices of several metals. Copper fell off over 2c and pig tin more than 1c. Spelter and lead also felt the effects of dull conditions. The market was quiet and no large buying was reported.

Copper lake dropped from 25c to 23½c and casting from 24c and 24½c to 22½c and 23c. Sheet zinc remained at 8.60c in car lots of 100-pound casks. Spelter fell from 7.25c to 6⅞c. Pig tin fell to 44c to 44½c from the last week prices of 45¼c and 45½c.

Lead desilverized continued to fall, sold at 5.50c to 5.60c instead of 5.75c and 5.85c in 50-ton lots as last quoted. Corroding remained at 6.40c to 6.60c. The price in car lots was 2½c higher. Cookson's antimony sold at 20c and 21c and other grades at 18c.

No important changes occurred in the buyers' prices quoted for second hand metals. Prices quoted were:

Copper wire, 17.75c to 18c; copper, heavy, 17.50c to 18c; copper bottoms, 16c to 17c; copper clips, 17c to 18c; red brass, heavy, 16c; yellow brass, heavy, 12c to 13c; red brass borings, 14c; yellow brass borings, 11c to 12c; light brass, 9c to 9.75c; zinc, 4.25c to 4.75c; pipe lead, 4.50c; tea lead, 4c to 4.25c; tin foil, 31c to 33c; pewter No. 1, 27c to 29c.

ST. LOUIS.

Joplin, Mo., July 14.

Lead and Zinc.—The American Lead & Smelting Co., since acquiring the William Lanyon smelters at Caney and Deering, Kas., continues to set the pace for ore prices in the Joplin district. As this is a subsidiary company of the United States Smelting, Refining & Mining Co., with $46,000,000 assets, which in turn controls, through the United States Mining Co., half of the stock of the International Metals Selling Co., it is a factor in the world's markets. This company has kept other smelting companies from a threatened lowering of the local ore market, notwithstanding the increased importation of low grade zinc ores from Mexico. For three months, representatives of other smelters have talked lower prices, and about the time they have attempted to put their threats into execution, the purchasing agent for the American company has taken the product off their hands at the price current before the cut, or at a slight advance. One of the strongest factors opposing the American is the subsidiary companies of the New Jersey Zinc Co.

The zinc smelting business in Missouri is beginning to assume a trust control for the first time in its history. The Cockerill smelters, one of the largest independent factors in the smelting business, is now under option, but to which of the opposing concerns, has not been made public.

The New Jersey company is a heavy holder in the United Metals Selling Co., and through this company has a strong hold upon zinc metal prices. It is a holder of land interests in Missouri and Kansas, but does not mine zinc in Joplin. This company also owns zinc interests in Wisconsin and old Mexico.

The highest price for the week was $50 per ton for zinc, selling on a base price of $46 to $48 per ton of 60 per cent zinc. These quotations are no higher than a week ago, but medium grade ores were advanced $1 per ton.

The lead ore market seems to have reached the bottom, and offers a slight improvement. Quotations $2 higher than a week ago are reported. The highest price was $58, medium grade ores selling at $54 to $56 per ton.

AFTER STEEL PLANT.

A strong effort is being made by the citizens of Baltimore to induce the location of a tidewater steel plant in that city. A committee from their number recently conferred with C. S. Clarkson of 100 Broadway, New York, who is a representative of those parties projecting the new plant. Mr. Clarkson has declined to divulge the identity of the parties backing the enterprise, but at the present time it is stated they are operating a plant in the interior and are desirous of removing to a tidewater site. If the project successfully develops and Baltimore is selected for the location, Cuban and Brazilian ores will be used.

Friday, July 12, was the seventy-fifth anniversary of the birth of James M. Swank, secretary and general manager of the American Iron and Steel Association, Philadelphia. Mr. Swank received many letters and telegrams of congratulations and numerous floral tributes.

DOCK WORKERS' STRIKE.

(Continued from Page 85.)

there was a large number of boats at the dock, the usual shortage was felt. The thing to be understood by this shortage is not so much that ore is not being shipped via Allouez as fast as it should be, but that the tonnage handled does not represent what the Great Northern road and docks could do if necessary.

The records of the three docks for the past week and the corresponding week a year ago are: Duluth, 540,681 tons as against 385,311 tons; Two Harbors, 360,009 tons as against 327,074 tons, and Superior, 228,723 tons as compared with 181,310. This shows a gain of 225,718 tons in the week this year. At the present rate the July movement would exceed that of June.

Ore Trimmers' Strike.

What has in it the possibilities of a severe check, however, developed this morning when the 750 ore trimmers at the Missabe docks on the day shift refused to start to work, demanding an increase of 25 cents. The trouble is not expected to be of long duration. The wage is now $2.25 for the day shift and $2.50 for the night shift and the demand is that both be increased. Early in the year an agreement was reached between the railroad and a committee supposed to represent the men, though they have no organization, and the present scale was fixed upon. That action does not appear to have been binding on the men, but it is believed that the dissatisfaction is practically all with the day men and that the night men are content with the present arrangement. If this proves to be true, the strike will probably be over in a few days. There are but eight boats at the dock today, all arriving yesterday, and they are being sent to Allouez, Two Harbors and Ashland.

MILLIKEN BROS. RECEIVERSHIP IS EXTENDED.

The term of receivership of Milliken Bros., Inc., has been extended three and one-half months by judicial order. Under the direction of the three receivers an active campaign for such new work as can be handled profitably has been begun, while outstanding contracts are being generally filled. The following statement, given out recently by Sullivan & Cromwell, attorneys for the receivers, explains the present status of affairs:

"Upon the application of William Nelson Cromwell, general counsel for the receivers of Milliken Bros., Inc., Judge Holt, of the United States District Court, has made an order authorizing Messrs. August Heckscher, William L. Ward and J. Van Vechten Olcott, the receivers, to continue the business for a further period of three and a half months with leave to apply for authority for a further continuance. Judge Holt's order also authorizes the receivers to pay the interest falling due on Aug. 1 next on the $3,000,000 of outstanding bonds of the company. The report of the receivers shows that the operating expenses have been cut down one-half; that nearly all of the outstanding contracts have been preserved and continued, and that the receivers have not had to exercise the power to borrow money which the court had conferred on them, and that to preserve the large equity above the mortgage bonds and conserve the interest of general creditors it is necessary and appropriate to save the mortgage from foreclosure by paying the interest on the bonds."

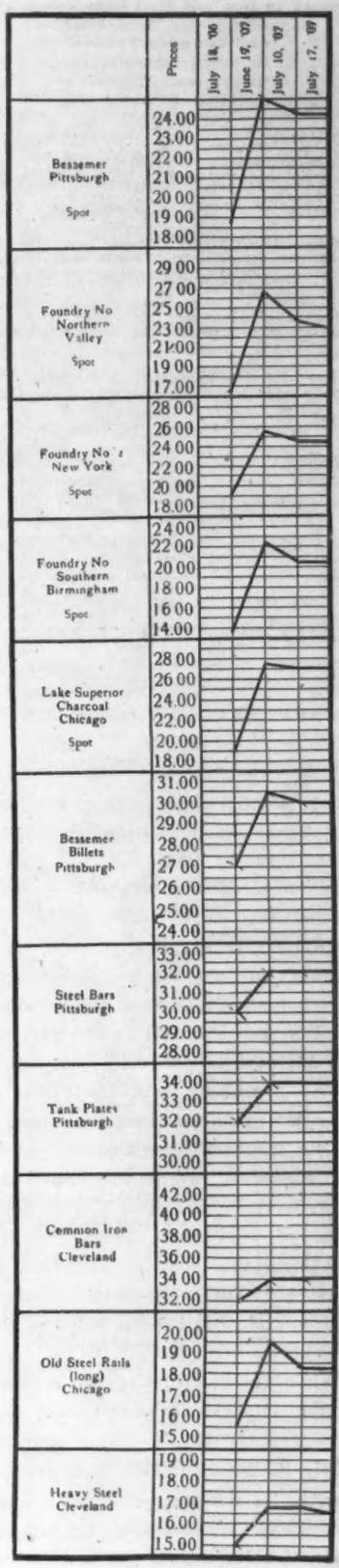
Seek More Dividends.—Minority stockholders of the American Steel Foundries, through the New York banking house of Swartwout & Appenzellar, are creating considerable agitation in favor of dividends on the preferred stock, claiming that an arrangement now exists by which four of the leading officials receive a heavy bonus on a sliding scale arrangement, the amount being dependent upon the net earnings of the company It is stated, however, that no drastic action will be attempted.

Activity in Mining.—Considerable foreign and western capital is being invested in coal properties in Alabama. St. Louis and Chicago men are becoming more interested in coal mines in this state. The coal mine operations in Alabama were never more active than they are at present. The coal production is heavier than ever and every ton being mined is finding a ready demand. The production for the year will go to 15,000,000 tons, is the opinion of many of the authorities on production.

Card Rate Unchanged.—As a result of the regular bi-monthly examination of the books of the Republic Iron & Steel Co., and the American Sheet & Tin Plate Co., the wages of the workmen in all departments during the next two months will be based on the same card rate as that existing during May and June. The examination has nothing to do with the advance asked by the workmen.

The Iron Moulders Union of North America will hold a convention in Philadelphia beginning July 22. There are 531 entitled delegates and 20 officers in addition. This is the first general convention that has been held by the organization in five years.

PRICE CHART.



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HEAVY EXPORTS OF MACHINERY.

Import and export statistics for eleven months of the year ended June 30 last are available, from which estimates can be made of the year's movement. The most striking feature of the export statistics is the large increase in value of machinery exports, an increase being indicated of about $12,000,000 over the previous fiscal year. Probably some part of this increase is due to larger valuations. Machinery still constitutes a trifle less than one-half in value of all our iron and steel exports, yet it has furnished nearly two-thirds the total increase in value. The total value of machinery exports in the past fiscal year may be estimated at about $88,500,000, the total value of all iron and steel exports being in the neighborhood of $180,000,000.

While there has been an increase in the total value of all iron and steel exports in the fiscal year of nearly $20,000,000, there has been a decrease in the tonnage of those articles which are reported by weight. These articles include pig iron, scrap, crude steel, and finished steel products up to and including such materials as nails and pipe and fittings. The total tonnage in the past fiscal year was about 1,225,000 gross tons, against 1,330,000 tons in the preceding year, and about 1,275,000 tons in the fiscal year 1905. While the exports have fallen, in point of tonnage, below those of the two preceding years, they are far ahead of any year before 1905.

The reason for this hundred thousand ton decrease in iron and steel exports is not to be found in the working out of any one principle. It might be thought that it has been due to the scarcity of iron and steel materials in the domestic market, but an examination of the detailed figures does not support this view. It is found, for instance, that exports of crude steel have greatly decreased, but on the other hand pig iron and scrap exports have increased. Whatever scarcity there has been of crude steel has been attributed to the scarcity of pig iron, yet pig iron and its concomitant, scrap, have been exported more largely. Again, steel rails have shown a large decrease, but steel bars and both iron and steel plates have shown a large increase. If there has been a scarcity in the domestic market it has been more of bars and plates than it has been of rails. Pipes and fittings constitute an exception to this rule of anomalies; their exports have fallen off, and they certainly have been very scarce. With this exception, these cross currents probably illustrate more than anything else the principle before emphasized in these columns, that in the matter of exporting iron and steel products American producers are largely at the mercy of the foreign markets. Their alleged "conquest" is rather the picking up of a deserted outpost here and there, which the foreign producers have been so strong as to be able to desert.

Our imports of iron and steel have shown a large increase, growing from 492,000 tons in the fiscal year 1906 to over 750,000 tons in the twelve-month just ended. Pig iron imports have been about 575,000 tons, increasing about 300,000 tons over the previous fiscal year, so that they alone account for all the increase in the fiscal year. Structural iron and steel imports show a large decrease, there having been abnormal imports in the fiscal year 1906. Scrap, rails, and hoops—chiefly cotton ties—showed a considerable decrease.

Outside, then, of the heavy imports of pig iron, a purely temporary affair, it can be said that our import and export movement in iron and steel in the past fiscal year has shown no marked variation. This is a twenty-five million ton country, and a variation of a hundred thousand tons either way in our imports or exports is quite unimportant, unless it furnishes advance evidence of a greater change to be expected. In this instance the variations do not show such evidence.

A VERY IMPORTANT DECISION.

The decision published in full in this issue in the case of the Stowe-Fuller Co. against the Pennsylvania and the Baltimore & Ohio railroad companies in regard to the rates on different kinds of brick is of far reaching importance. Commissioner Lane, in his report in behalf of the Interstate Commerce Commission, points out very clearly the injustice of charging one rate for fire brick and another for building brick and still another for paving brick, as it does not cost the railroad any more to haul one kind of brick than another. "Classification," he says, "must be based upon a real distinction from transportation standpoint, and we can find no such distinction between these three classes of brick, which are made of the same material and come out of the same kiln, as justifies a difference in rates. To hold otherwise would be to promote false billing on the part of shippers and to require the carriers, if they would avoid the penalty of the law, make a practically impossible examination into the use to which each shipment of these britks was put."

This establishes a very important principle which applies to many other articles beside brick. In the hearing, it was developed that the policy in establishing rates was to charge as much as the traffic would stand. It was argued that, as the iron business is profitable, it could afford to pay well for transporting brick for use in its furnaces. Hence, a man erecting a house at Gary, Ind., would pay $1.70 per ton for hauling his brick, while the Indiana Steel Co. would be compelled to pay 50 cents per ton more for brick to be used in lining furnaces. The idea is the same that govern the physican who charges a rich patient more than a poor one, but it is hardly a principle that can be allowed to govern in railroad transportation. Countless other instances—such as charging more for hauling one kind of castings than for another of equal weight and size—could be cited, and it is probable that this decision will be followed by numerous appeals to the Interstate Commerce Commission for a general readjustment of rates to conform to the recent decision.

The Stowe-Fuller Co. deserves the thanks of the iron trade and of many other trades for carrying this important case through a series of years to a successful conclusion. After one traffic association after another had been appealed to in vain, the matter was taken before the Interstate Commerce Commission and promptly decided.

No discriminations are now allowed in rates of freight but discriminations in classification are common and the present classification on materials is so complex that even the railroads themselves are unable to give any reasonable basis for them.

If the Interstate Commerce Commission in its great work will compel the railroads to simplify their classi fications and methods, it will be doing a great favor to the railroads as well as the general shipping interests.

The E. H. Mumford Co., Philadelphia, manufacturer of molding machines, is sending to the trade a handsome souvenir in the form of a watch guard, to which is attached an oxidized silver charm, a replica of the Liberty bell.

NEW BLAST FURNACE

IN WASHINGTON WILL SOON BE IN OPERATION.

Car Works Nearing Completion.—Molders are Defeated in Their Strike.—Other Industries on the Pacific.

(Special Correspondence.)

Seattle, Wash., July 10.—The new blast furnace, which is being built by James A. Moore at Irondale, near Port Townsend, Washington, will be in operation within thirty days. It was originally planned to start the plant on July 4, but unforeseen delays in the installation of the machinery have forced the postponement. The plant at Irondale will have a capacity of sixty tons per day, is the only blast furnace in American territory west of the Rocky Mountains, and will make high grade, pure charcoal pig exclusively. The charcoal, which is more economical and satisfactory on this coast than coke, will be made of fir and alder logs taken from the forests adjacent to the works. The plant has 20 charcoal kilns 30 x 30 feet with a capacity of 75 cords of wood and can make charcoal for 4½ cents per bushel. Mr. Moore has entirely remodeled and modernized the Irondale works; new bosh plates and a new water jacket have been put in the furnace, which has been entirely relined and extended ten feet higher, making the total height now 60 feet. The stoves have been completely rebuilt, a new power plant installed, the charcoal kilns rebuilt and extensive improvements have been made to the docks and ore handling machinery.

The rolling mill of the Pacific Steel Co. at Youngstown, near Seattle, has been shut down for repairs since July 1; the mill is expected to begin running again July 15 with a full force of 100 men. Mr. E. M. Wilson, president and manager, stated in an interview that up to date his company had experienced no diminution in business, that the plant is now filled with orders and were it not for absolutely necessary repairs, the present two weeks' shut-down would not have occurred. The plant rolls merchant bar iron and light rails exclusively.

The new works of the Seattle Car Mfg. Co. at Renton are nearing completion. Wm. Pigott, president, reports that he hopes to have the new plant in operation some time in August. The new works, which will put the company in a much better position to handle its business, occupies 155 acres at Humphrey Station, near Renton, a manufacturing suburb of Seattle. The buildings, with the exception of the office which is brick, are frame structures of the following dimensions: Foundry 75 by 80 feet; blacksmith shop, 75 by 80 feet; machine shop, 100 by 250 feet; erecting shop, 100 by 250 feet; wood shop, 75 by 175 feet; power house, 50 by 60 feet; paint room, 100 by 100 feet; store house, 40 by 60 feet; and office 50 by 60 feet. The new plant will employ 200 men.

The strike which was instituted by the Northwestern Molders' Union against the Pacific coast foundries early in May, is practically broken. For over six weeks the foundrymen have been quietly and steadily importing non-union men until now J. D. Morris, secretary of the Pacific Coast Foundrymen's Association, reports that practically all of the plants are operating without inconvenience. The molders have receded from their original position demanding an eight-hour day with no decrease in wages, and are willing to compromise on an eight-hour day with a corresponding cut in income. The foundrymen feel, however, that they cannot give any further concessions; many firms are now paying $4.00 per day to their non-union molders, and with the labor market well supplied no further trouble is anticipated from the strike. The firms are willing to reinstate their old men as far as possible, and it is expected that with the return of cold weather many molders will be seeking their old positions.

James J. Hill, who has for some time been quietly absorbing all the available coal deposits of the Pacific northwest, has recently secured a controlling interest in the $50,000,000 Crow's Nest Pass Coal Co. of British Columbia. Mr. Hill has owned 45 per cent of the Crow's Nest stock for several years, but it was only recently that he was able to get a controlling interest. The deal was put through by Jay P. Graves, president of the Inland Empire System of Spokane and involved the purchase of 8,000 shares which cost Mr. Hill $3,000,000. The securing of this property by Mr. Graves insures a good supply of coke for the nearby Granby smelters. These smelters use from 500 to 600 tons of coke per day, while the capacity of the Crow's Nest plant is 1,300 tons daily; the balance of the coke is sold to outsiders. It is believed that the Crow's Nest company will be re-organized with Mr. Graves as one of the directors.

W. H. Culver of Grand Rapids, Mich., announces the construction of a stove foundry at Puyallup, Wash. Mr. Culver is now in Grand Rapids closing the preliminary arrangements and work on the new plant will begin immediately.

CINCINNATI PLANTS

Have About All the Orders They Can Take Care of This Year.

Office of THE IRON TRADE REVIEW,
124 Government Place,
Cincinnati, July 15.

While the volume of new business and inquiry has been lessened compared with the recent rush of demand, this is attributed more to the advent of the summer season rather than to any basic conditions. Most of the plants have all the business booked they can take care of this year. Prices are well maintained. The only feature of competition seems to be in deliveries. There are but few cancellations and when an order happens to be cancelled, it gives the shop some prompt delivery machines, which is an advantage. Machines of unusual specifications such as special sizes are not easily obtainable as the shops are too busy to make it desirable to run such orders through, thus interfering with schedules on regular sizes. There are additions and improvements being made in many of the shops and new machinery is being installed with a view to increasing output. The high pressure at which the shops have been running and are still under has made the demand for increased facilities imperative.

The Lodge and Shipley Machine Tool Co. is installing a new 200 kilowatt power equipment which is expected to be in operation in the next thirty days. A new building is erected to accommodate the new power plant which will be used to run all the machines in the company's shop No. 2, which was formerly the Dietz Machine Tool Co.'s plant.

The John Steptoe Shaper Co. has received orders for two 16-inch motor driven shapers for the Russian arsenel at Kief.

The Cincinnati Shaper Co., Cincinnati, O., manufacturer of standard machine tools, which recently increased its capital stock, took this action both to reduce its surplus, which was becoming quite large, and to provide for an extension to its plant and for further equipment. The extension, which is in the course of erection, will add about 50 per cent to the company's capacity. The company is now very much crowded for want of room. Equipment is being added from time to time and other machinery has been ordered which will be delivered when the addition is completed. The company is enjoying a prosperous existence, its production last year showing an increase of about 65 per cent over that of the preceding year. Perrin G. March is president and Larz W. Anderson secretary and treasurer.

L. C. Twachtman, formerly connected with the Fosdick Machine Tool Co., has recently become the head of the Vulcon Foundry Co., of Cincinnati, having secured a controlling interest in that company. Mr. Eugene Frintz, the retiring president and manager of the Vulcon Foundry Co., is in ill health, and will go to Colorado for a rest. The new interests which have taken over the plant intend to spend considerable money in enlarging it.

MAY INSTALL KENNEDY TOPS.

The Jones & Laughlin Steel Co., Pittsburg, since it was enjoined by the court and ordered to abate the ore dust nuisance at its Eliza furnaces has opened negotiations with Julian Kennedy with the end in view of installing his new closed tops on the five furnaces at the Soho plant. In order to make this change it will be necessary to reconstruct a large part of the furnaces, but this is in line with the policy of President B. F. Jones of the Jones & Laughlin Steel Co. and doing everything possible to eliminate the nuisance complained of by the residents in the vicinity of the steel plant.

This new top invented by Julian Kennedy was fully described in a lecture by him given before the Engineers' Association of Western Pennsylvania, and published in THE IRON TRADE REVIEW of Feb. 28, 1907.

IRON ORE ON CHURCH LANDS.

Iron ore deposits of good quality have been discovered in Sussex county, N. J., on a tract of 175 acres recently left to the North Reformed church of Newark, N. J., by Mrs. Eliza Crane. The ore body was located several months ago, since which time the church trustees have been prospecting to discover its extent. They have found abundant evidences of an extensive deposit, the ore running as high as 58 per cent in iron with very little sulphur. They have not yet been able, however, to demonstrate that the ore vein is of sufficient extent to warrant the outlay necessary for its development and are now hoping to interest in the project some one who will thoroughly explore the property, and, if it proves up as expected, work it on a royalty basis. Rev. James I. Vance, pastor of the church, states that by the provisions of the behest any moneys accruing from the land must be devoted to missionary purposes.

AIM OF NEW CONNECTICUT IRON, STEEL & COKE CO.

In connection with the incorporation of the Connecticut Iron, Steel & Coke Co., Bridgeport, Conn., President Frank A. Wilmot, of the American Tube & Stamping Co., Bridgeport, whose name has been connected with the new enterprise, has issued a statement of the aims of the new company as well as of his own active interest in the project. Mr. Wilmot states that the American Tube & Stamping Co. is not in the project except as a consumer, and while very much interested in its success in promoting local competition for raw material used by that plant, is not backing the enterprise financially, preferring to develop its own line of business.

"Up to the present time all the foundrymen and open-hearth steel melters in Bridgeport and within a radius of 25 miles or so of Bridgeport have been compelled to buy their pig iron in distant American markets, in Europe, and some even from China," says Mr. Wilmot. "I understand it is the general desire of these consumers to have a home competition for their trade located in western Connecticut generally considered the principal metal working district of New England.

"I am unable to make public any more than to the extent of the names given in the charter application itself those back of the project, but I know, besides the Hartford gentlemen whose names appear therein, a number of people already in the iron and coal mining business and who are operating blast furnaces and selling pig iron, coal and coke, who I understand are either back of the project or seriously considering becoming identified therewith in the development of such a business, either under the charter at present under consideration by the General Assembly of Connecticut and with a part of its plants then located at Bridgeport or, as I have been told, under another charter of similar character with the location then of its plants somewhere in the vicinity of Greater New York. For obvious reasons they generally desire to have their identity withheld from the public prior to completing their organization and formulating their plans."

A neat six-inch rule is being sent to the trade with the compliments of the United Engineering & Foundry Co., Pittsburg, manufacturer of complete equipment for steel and iron works and tube plants.

WIRE PLANTS

Of Washburn Wire Co. to be Centralized—New England's Industrial Field.

(Special Correspondence.)

Worcester, Mass., July 14.—The Washburn Wire Co. will move its Auburn, R. I., plant to Phillipsdale, R. I., about Jan. 1, 1908. The company is erecting five new buildings at Phillipsdale, near the present plant at that place. The new structures will cover an area of about 52,500 square feet and will cost considerably over $100,000. This move will centralize the company and increase its facilities. The main new building will be 164 x 70, brick with gravel roof. Machinery will be electrically driven by a series of motors developing 500 horsepower. This will be a wire mill. The rod mill will be a steel structure 180 x 115. Near the rod mill will be the power house 180 x 50, steel and brick. The power house will have two tandem compound engines, developing 2,000 horsepower, to be used principally for driving the rod mill. In addition there will be two generators of 150 kilowatts, direct connected, one generator of 75 kilowatts, direct connected and one generator of 100 kilowatts, belted. The boiler house will be 96 x 50 and will contain eight horizontal boilers capable of developing 2,500 horsepower. It will be of steel construction. There will be a brick stack 150 feet high with seven-foot flue. The annealing and cleaning rooms will be under the same roof, 96 x 84, built of brick. The new plant will be located directly south of the open-hearth and blooming mills of the present Phillipsdale plant. The ouput of these mills is steel ingots and billets, which is the material to be used in the new plant and can be conveyed to the new mills at no loss of time or expense. The Washburn Wire Co. has a branch in New York city, and leased its Auburn plant in 1903 from the John Wales Wire Co., but later purchasing it. It has now sold it to the General Fire Extinguisher Co., Providence.

The Wright Wire Co., Worcester and Palmer, Mass., is adding to its mills and power plant.

The Heald Machine Co., manufacturers of grinding machinery, Worcester, Mass., has its new addition about completed.

The Landers, Frary & Clark Co., New Britain, Conn., manufacturers of hardware and table cutlery, has filed a certificate increasing its capital stock from $1,000,000 to $1,250,000. The new capital is to be used for enlargements.

The Norton Co., Worcester, Mass., has installed a gas power central station extension to its steam plant to facilitate the operation of its numerous motor drives of varying loads, using a Westinghouse 500-horsepower internal combustion engine direct-connected to a direct current generator. Tests show the gas engine requires about one-third as much coal as the steam engine, or in other words, the steam engine requires 2.88 more than the gas engine. The cost of this gas power addition, including building, producers, holder and engine, is $60,000. The plant includes a Loomis-Pettibone producer, the gas holder having a capacity of 30,000 cubic feet. This is practically the first gas power plant in use in Worcester, and although one unit only is installed, the Norton Co. contemplates putting in a second unit. The plant will then occupy a building 60 by 64 feet, or 6.4 square feet per kilowatt. The American Steel & Wire Co. contemplates putting in a similar plant.

LARGE INCREASE

Shown in Earnings and Surplus of Westinghouse Electric & Mfg. Co.

A large gain in its net earnings and surplus available for dividends for the fiscal year ended March 31 is shown by the report of the Westinghouse Electric & Mfg. Co. The company's consolidated income account for the year from March 31, 1906, to March 31, 1907, and for the two months from March 31 to May 31, 1907, follows:

	Fiscal year ended Mar. 31, '07.	Two mos. ended May 31, 07.
Earnings	$5,486,712	$1,377,765
Monthly average income	457,266	688,882
Disposition of earnings:		
Interest on convertible sinking fund bonds and debenture certificates	827,887	143,983
Interest and discount	815,266	185,121
Property and plant depreciated, accounts and bills receivable, and other assets written off	457,400	47,857
Adjustment of sundry old accounts not relating to current year's business, charges to depreciation, development, expenditures charged to operation and various adjustments for current year (net)	753,897	151,339
Deductions	$2,954,512	$528,301
Surplus	$2,532,200	$849,464
From this surplus there were paid 10 per cent dividends on preferred stock $399,870		
10 per cent dividends on assenting stock. 2,099,685		
	2,499,555	416,592
Balance	$32,644	$432,871

Commenting upon this showing, George Westinghouse, president of the company, says in his report to the shareholders:

Owing to the heavy floods in March, the last month in the fiscal year, the company lost considerable ground as it was unable to make shipments except to a nominal extent. Except for this, the showing for the year would have been considerably better than was the case.

The benefit of the March business was felt in April and May. Partly owing to this and partly owing to the general increase in the volume of business the earnings in April and May were record breaking.

The increase of nearly $500,000 in the surplus available for dividends is considerably smaller than normally would have been the case, owing to the fact that, in view of the large earnings of the company, the management decided to write off sundry old accounts not pertaining to the current year's business and to allow more heavily than ever before for general depreciation, and development work. To this extent, therefore, the surplus of $2,532,000 does not measure the real surplus earnings of the Westinghouse Co. for the late year. Except for the abnormal charges for depreciation and sundry accounts it would have been probably $500,000 greater.

The results for the two months show a surplus of $432,871 over all interest charges, depreciation, adjustments, 10 per cent dividends, etc. This is at the rate of nearly $2,000,000 a year earned over everything. Heavier allowances were made for depreciation, etc., in these months than ever.

Of course these two months should not be taken as a criterion of what will be done in the current fiscal year, because they were benefited by the bad weather conditions prevailing in March. However, June earnings continue to show heavy gains. The quarter just closed is the best the company ever had, and the indications are that the current fiscal year will be a record-breaker.

CAR OWNERS TO MEET.

There will be a meeting of the individual car owners of the United States in Cleveland, Thursday and Friday, August 1 and 2, for the purpose of forming an association to devise such plans as may best further their interests. At the present time, the most pressing questions are the placing of individual cars on a basis equal with that of the railroad company cars and the application of the per diem charge to also govern the use of the individual car when delayed. The owners of individual cars have been dissatisfied with the control which they have exercised over these problems in the past. The invitation which is extended to all individual car owners has been sent out by individual car owners of Cleveland and Pittsburg, who have realized the necessity of changed conditions.

H. Stuart Hotchkiss and Frederick B. Farnsworth, receivers of the National Steel Foundry Co., New Haven, Conn., have been ordered by the Superior court of New Haven county to receive sealed bids up to Aug. 10 for the purchase of the plant of the company. The plant has been appraised at $210,790.60.

PERSONALS.

H. C. Frick sailed for Europe June 9 and will not return until the latter part of August.

E. W. Mudge, a Pittsburg broker, is spending two weeks with his family at Cape May.

President C. W. Bray, of the American Sheet & Tin Plate Co., will start for Canada this week on a two months' vacation.

President Huston, of the Lukens Iron & Steel Co., was in New York last week, en route by motor car to his summer place in the Catskills.

T. S. Troxell, formerly with the Robertson Iron Co., Cincinnati, has become sales' manager of the Portsmouth Steel Co., Portsmouth, O., succeeding Edwin Conners.

George E. Day, secretary of the Youngstown Sheet & Tube Co., Youngstown, O, is in the wilds of Canada on a hunting and fishing trip.

John Lockhart, superintendent of the ship yards of the Harlan & Hollingsworth Corporation, Wilmington, Del., has resigned and sailed for England.

H. H. Hewitt, president of the Magnus Metal Co., Buffalo, has been elected a director of the National Copper Bank, New York, to fill the vacancy that has existed since its organization.

Lafayette Crowley, superintendent of the Detroit Stove Works, Detroit, is making steady progress in his recovery from an attack of paralysis which confined him to his bed about two months ago.

W. E. Holloway, who has been connected with the sales force of the mining department of the Jeffrey Mfg. Co., Columbus, has been stationed at Pittsburg in charge of the sales of the elevating and conveying machinery of the company.

A. S. Blanchard, manager of the steel casting department of the Wellman-Seaver-Morgan Co., Cleveland, resigned July 1 to accept the position of assistant to the president of the Atha Steel Casting Co., Newark, N. J.

J. B. Stubbs, of Cleveland, formerly president of the Struthers Furnace Co., sails this week accompanied by Mrs. Stubbs for a year's sojourn in Europe and other foreign countries. Mr. and Mrs. Stubbs spent the winter in California and recently returned to Cleveland.

C. E. Crowther, at one time superintendent of the Niles furnace of the Carnegie Steel Co., has been made chief blower of the Ohio furnaces, Youngstown, O., succeeding Harry S. Braman, who resigned to assume charge of the furnaces of the Youngstown Sheet & Tube Co.

John W. Lawrence will sever his connection as manager of the Pittsburg Tool & Drop Forge Co., Cheswick, Pa., Aug. 1, and will actively interest himself as vice president in charge of sales of the Howell Car & Foundry Co., with general offices in the Fulton building, Pittsburg. The company's line of manufacture will be mine cars, castings, forgings and the Hughes patent furnace.

Supt. W. H. Ebsary, of the bricklaying department of the Lackawanna Steel Co., Buffalo, has resigned to accept a position with the Gary, Ind., plant of the United States Steel Corporation which is now building. Forty of his associates at Buffalo tendered him a banquet before he departed. Mr. Ebsary was presented with a gold watch and chain.

D. G. Kerr and James Gayley, arriving at Duluth a week ago on the steamer W. E. Corey, have just concluded a trip over the mining properties of the Steel Corporation in company with the officers of the Oliver Iron Mining Co All the ranges were visited. The inspection had to do largely with the demands of the furnaces for more severe requirements in the ore supplied. Mr. Gayley returned to New York before the completion of the trip.

William T. Shepard, of the firm of Rogers, Brown & Co., has been elected a director of the Buffalo & Susquehanna Iron Co., to fill the vacancy of the board which was caused by the death of Frank H. Goodyear. Stephen M. Clement was elected first vice president, a position which was also held by the late Mr. Goodyear. Charles W. Goodyear was elected second vice president. William A. Rogers, president; Hugh Kennedy, general manager; H. D. Carson, secretary and treasurer, were again elected to their respective places.

Milton J. Budlong, president of the Electric Vehicle Co., Hartford, Conn., has resigned, to take effect Sept. 1. He was president four years and was connected with the company for nine years. Hiram Percy Maxim, chief engineer, is to sever his connection Aug. 1. With Hartford and New York capital Mr. Maxim intends to start a new corporation for making electric-pleasure vehicles, also commercial vehicles, and, later, gasolene cars. Harry W. Kyte, who has been secretary and assistant treasurer of the Electric Vehicle Co., has been elected third vice president and manager of sales department. H. W. Nuckols, who had been assistant to Mr. Kyte, has been made secretary and treasurer.

OBITUARIES.

T. J. Clark, treasurer Chicago Shaft Co., Chicago, died at Bryan, O., July 15, from injuries received from an automobile accident July 11.

William Rowland, president of the Maxwell Rowland Shovel Works, Holmesburg, Pa., died suddenly July 9 at Holmesburg, aged 56. He had been connected with this concern practically all his life.

William Hayes, president of the Republic Construction Co., Cleveland, died July 16 from heart failure. Mr. Hayes was with the Gary Iron & Steel Co. for 35 years previous to the formation of the Republic company.

P. H. Gladfelter, a prominent manufacturer of Spring Grove, Pa., died recently at York, Pa., at the age of 70. He was largely interested in the York Mfg. Co., York, Pa., manufacturer of refrigerator machinery. Mr. Gladfelter was at the head of a number of enterprises throughout the United States and was particularly prominent as a paper manufacturer.

Joseph Bradford Sargent, of Sargent & Co., hardware manufacturers of New Haven, Conn., died July 15 at the age of 85. In addition to his prominence as a manufacturer, he was active in municipal affairs, being mayor of New Haven for two terms, 1891 to 1895. He was an earnest advocate of municipal ownership and of free trade. His sons are all interested in Sargent & Co.

James Macbeth, master car builder of the New York Central railroad, died July 5 at his home in Buffalo, after a brief illness. He was born in Aberdeen, Scotland, and began work as an apprentice in the machine shops of the Great Western of Canada in 1859. In 1864 he became foreman of repairing and rebuilding of locomotives on the New York Central, and by successive promotions was elevated to the position he held at the time of his death.

Will Build Railway.—Cable dispatches from Cologne, Germany, state that the Prussian government railway authorities have decided to build an electric railway from the Essen coal and iron district across the semi-mountainous Eifel region to the Saar and Lorraine districts. The object is to secure the cheapest transportation for heavy freight from Lorraine, which produces enormous quantities of low grade iron ore, and to likewise improve the facilities in Essen, from which Lorraine draws a vast tonnage of coal and coke.

THE ELECTRIC HOIST AND ITS APPLICATIONS

Transportation of raw and finished materials through and between various departments of a manufacturing plant plays such an important part in industrial economy today that any factory in which this subject has not been given careful consideration is seriously handicapped in competition with other manufacturers in the same line. The growth of methods of transportation has up to recent years been comparatively slow and along certain well-defined lines. It may be divided generally into the periods of the jib crane, the traveling crane and the stationary and trolley hoists. The jib and traveling cranes have special fields into which the hoist cannot well intrude, although the larger sizes of hoist fill the functions of a small traveling crane. These fields are the handling of large and bulky machines or parts within a certain radius in the case of the jib crane and for long distances by the traveling crane. It has been, and still is, the custom to install a small traveling crane over a group of light machine tools to serve them. This particular field, however, has been largely invaded by the hoist, either of the hand, pneumatic or electric type.

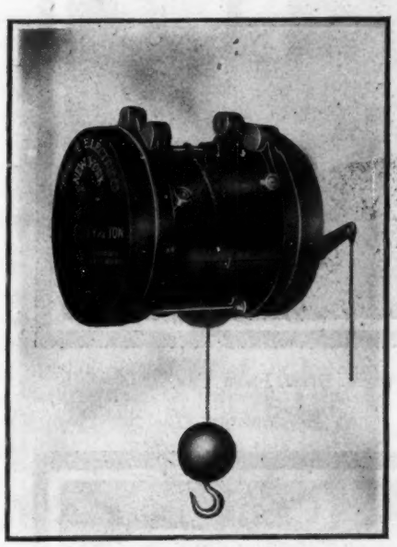


FIG. 1.—HALF TON ELECTRIC HOIST.

It is not the purpose of this article to go into a discussion of the installation and operation of the older forms of crane, but rather to devote it to this later application, which may be called a specialization of hoisting and conveying machinery, nor is it the purpose to give more than a passing notice to the hand hoist and the pneumatic hoist, but to call attention to the most recent development of the electric hoist and its numerous modifications and applications. The internal construction of the hoist will not be dwelt on. That is largely a matter for the companies which are engaged in the designing and building of this class of machinery. The user of these machines is concerned largely with the particular combination best suited for his needs, and it is proposed to show later a few arrangements which have been devised to fill various special conditions. The writer is indebted to the Sprague Electric Co., New York, for photographs and a large amount of the information contained in this article, which was obtained in the course of a recent visit to that company's plant at Bloomfield, N. J.

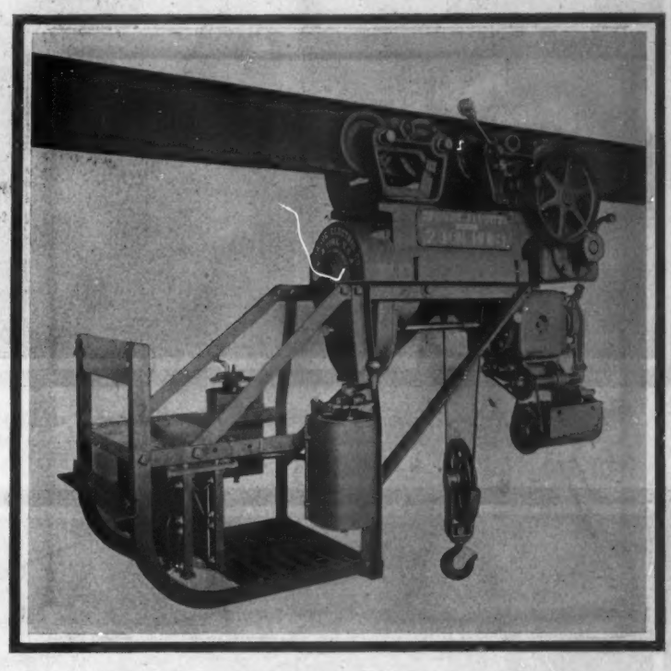


FIG. 2—ELECTRIC TRAVELING HOIST, WITH CAGE FOR OPERATOR.

Probably the earliest form of hoist ever used over a machine tool consisted of a simple block and tackle suspended over the machine, the motive power being supplied by the machinist himself, or by a couple of laborers. The next development was the chain hoist, which enabled one man to raise a considerable load and have it remain suspended without fastening or holding the chain. An early form of power hoist was the pneumatic cylinder hoist, comprising a long cylinder with a piston on the inside, a hook being placed on the lower extremity of the piston rod. Air under pressure admitted underneath the piston elevated the load, which could be held in position by shutting off the air supply without opening the exhaust. This form of hoist is still largely used throughout the country, although it is not as convenient as many other types. Suspending this hoist from a trolley converted it into a rude traveling crane by means of which moderately heavy loads could be transferred from place to place with greater facility and speed than they could be carried by hand or moved on a track. The limitations of this form are quickly reached, however, as considerable head room is necessary, and, in order to handle extremely heavy weights, an inordinately large cylinder is required. To overcome these difficulties, two types of hoist have been devised—the electric hoist, which is the subject of this article, and a pneumatic hoist employing a pneumatic engine to operate a winding drum instead of a direct air pressure.

Certain features are common to all electric hoists, whether they be of the stationary or traveling variety, and it will be well to fix these features in mind before going on with the applications of the different types. They all comprise a winding

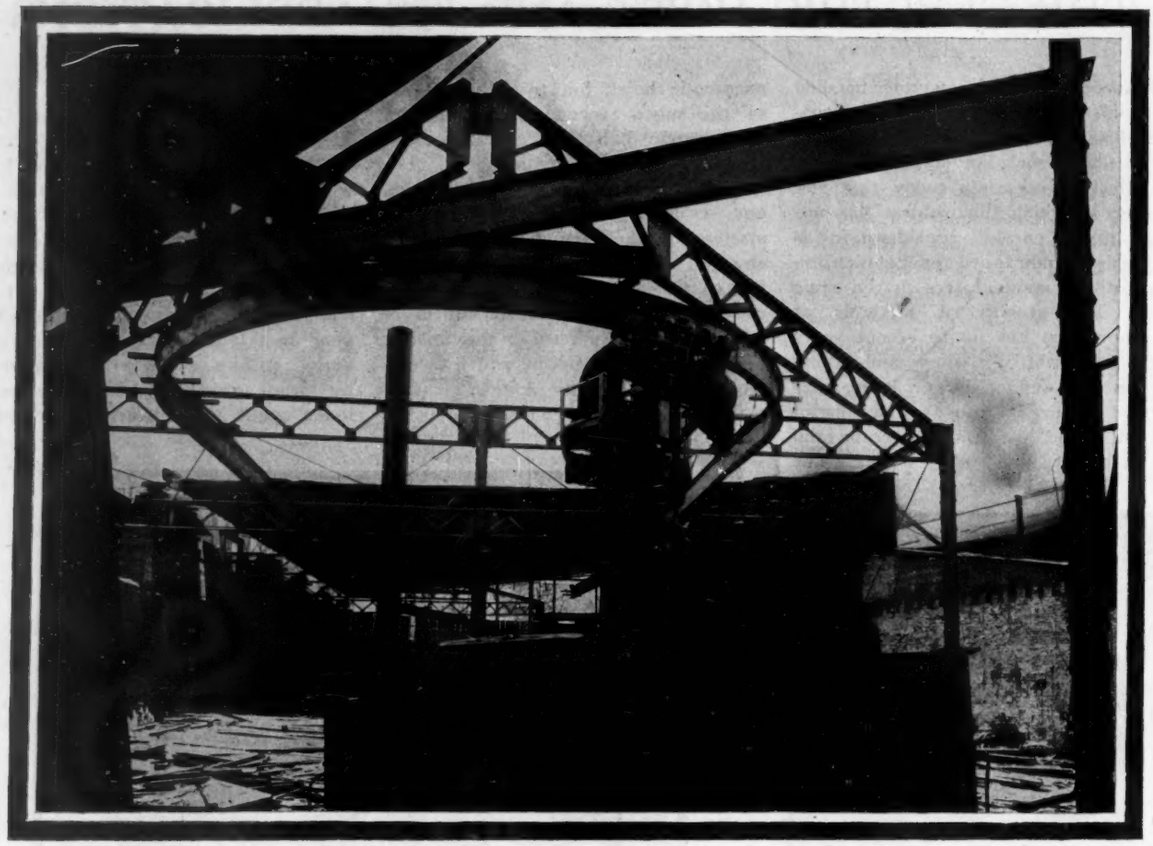


FIG. 3.—TRAVELING ELECTRIC HOIST USED FOR UNLOADING STRUCTURAL STEEL FROM CAR.

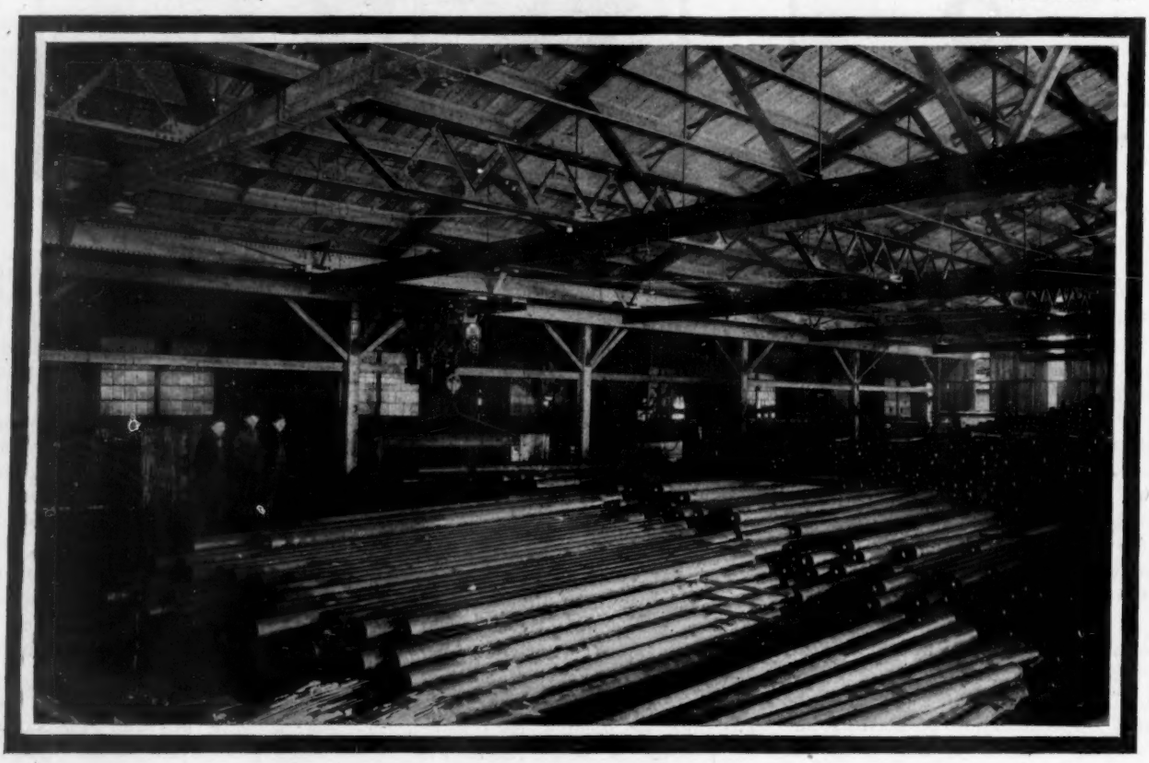


FIG. 4.—TRAVELING ELECTRIC HOIST ON TRANSFER BRIDGE FOR HANDLING PIPE.

drum driven by a motor, although the method of applying the motor varies with the conditions to be met. Limit switches are provided, which automatically shut off the current when the load reaches predetermined points either in hoisting or lowering, preventing damage to the machinery or motor by the load being brought up against any of the stationary parts. All have control giving a single speed of hoisting and lowering or rheostatic or foundry control giving a multiplicity of speeds. The hoists are fitted with a brake operated mechanically or electrically, and which comes into service instantly on cutting off the current, preventing the load from falling. In addition, there is a hoist brake which prevents undue acceleration of the load when lowering, and makes the motor drive the load down, instead of having it descend by gravity. The motors are series wound and are dust and moisture proof.

The smallest form of hoist is shown in Fig. 1, and is designed to fill the same field as pneumatic cylinder hoists and chain blocks. It has a capacity of ½ ton, which it will raise through a vertical lift of 30 feet in one minute. This hoist may be suspended from a trolley or fixed in one position, and forms a convenient means of serving a machine tool or handling moderate weights through a hatchway or in similar situations. A great advantage possessed by this machine is the low head room required, a feature common to all electric hoists and to pneumatic hoists of the pneumatic motor type. The convenience in operating is also a feature. The load being once attached, it is only necessary for the operator to pull the rope attached to the controller handle. The fact that a limit switch is provided makes it fool-proof in the hands of the most ignorant laborer, for should he forget and allow the load to pass beyond the safe operating point, the limit switch will come into play and cut off the current before any damage is done. The hoist brakes will prevent the load from descending and hold the load suspended while the hoist is being moved from place to place on a trolley. This type of hoist has the motor shaft parallel to the drum shaft, power being transmitted from the former to the latter through a spur gear train. Other forms are built with the motor at right angles to the winding drum, the power being transmitted through a worm wheel.

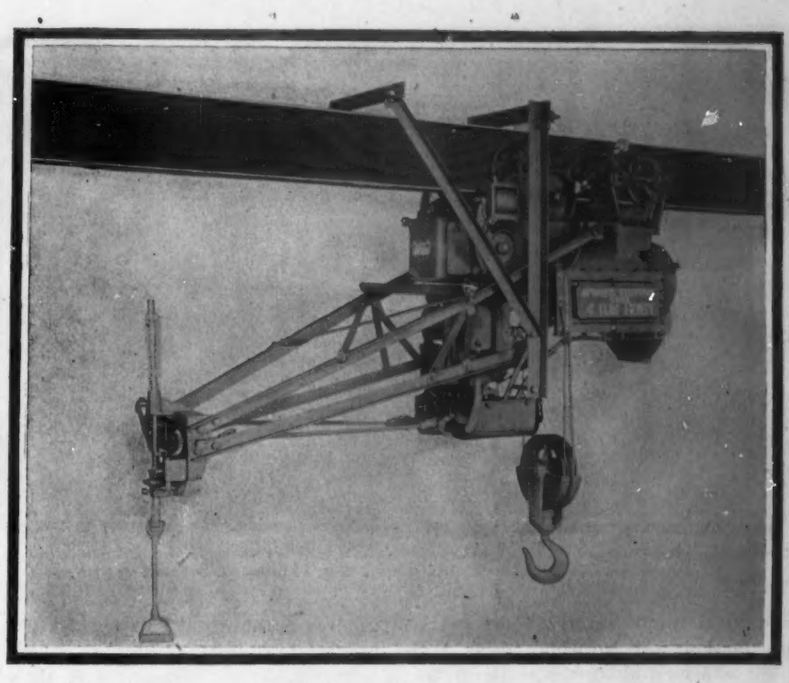


FIG. 5.—ELECTRIC HOIST WITH OUTRIGGER FOR HANDLING HOT METAL.

These smaller hoists when suspended from a trolley are moved from point to point by hand, being in all cases controlled from the floor by pendant chains operating the controller.

When the load to be handled is greater than two or three tons, it is inconvenient and expensive to move the hoist from point to point by hand. The logical step is then to put an

FIG. 6.—ELECTRIC HOIST FOR HANDLING LONG SHEETS.

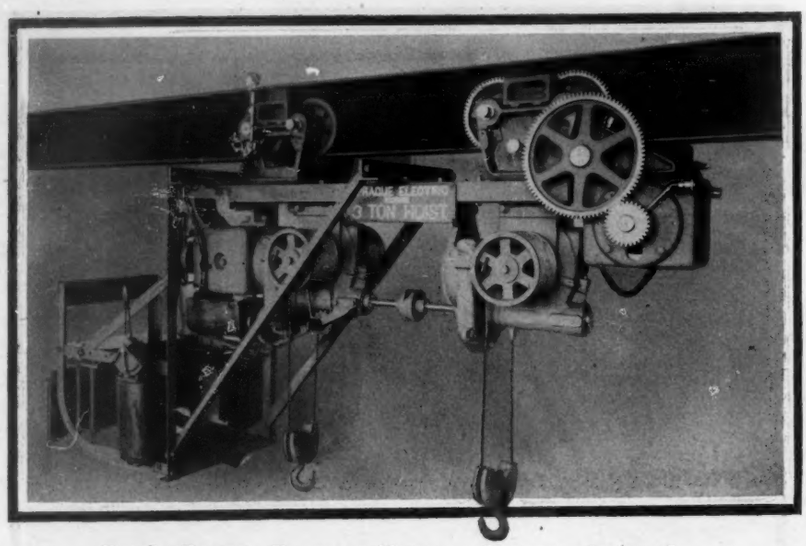


FIG. 7.—ELECTRIC TRAVELING HOIST FOR HANDLING LOADED SKIPS.

additional motor on the hoist geared to traction wheels, which drive both hoist and load along the trolley track. For many purposes, it is entirely suitable to operate this machine from the floor by means of pendant chains, the operator walking underneath alongside the load. Conditions sometimes arise, however, in which it is impracticable for the operator to do this, as, for instance, when the path of the trolley is over machines or piles of castings, or across deep pits. Under these circumstances, a cage is added to the hoist, in which the operator rides, a controller being placed on each side of him, one for the hoist motor, the other for the traction motor. A hoist of this type is shown in Fig. 2. Under certain circumstances, two of these hoists may be coupled together, both as regards the hoist and traction motor, and by this means loads of considerable weight can be handled. The hoist, under these circumstances, is to all intents and purposes a traveling crane, and in the more highly developed applications, the line of demarcation between the hoist and crane is not clearly defined. It is with these special applications that we have the greatest interest. The ordinary simple hoist can be used practically wherever a chain hoist or block and tackle would be of service, and to specify the numerous possible applications of it would not only be useless, but consume more space than can be given here. The hoist shown in Fig. 2 has a double trolley carriage of the swivel type, which enables it to traverse curves of a minimum radius of six to eight feet according to the size of the I-beam used as a runway. This enables it to operate in contracted spaces.

In Fig. 3, this equipment is shown unloading structural steel from a car. Structural steel has always been a rather mean proposition to handle, especially in long lengths. Except in the larger sizes of I-beams and channels, it is not heavy enough to require the services of a traveling crane, yet is too bulky to be conveniently handled by men. It is in a situation of this character that the motor-driven electric hoist proves of great value. The hoist shown has four ropes and a capacity of about four tons on the hook. A spreader bar is suspended from the latter, at the ends of which are attached the slings for holding the pieces of structural steel which are to be moved. This arrangement of the spreader bar minimizes the deflection of material when suspended. The path of the track, as clearly shown, permits the hoist to reach practically every part of the storage shed. If necessary, the area covered by this apparatus could be greatly increased by means of the arrangement shown in Fig. 4, which is an application and amplification of the same idea.

Fig. 4 illustrates the same type of hoist mounted on a transfer bridge, and used for handling pipe in a store-

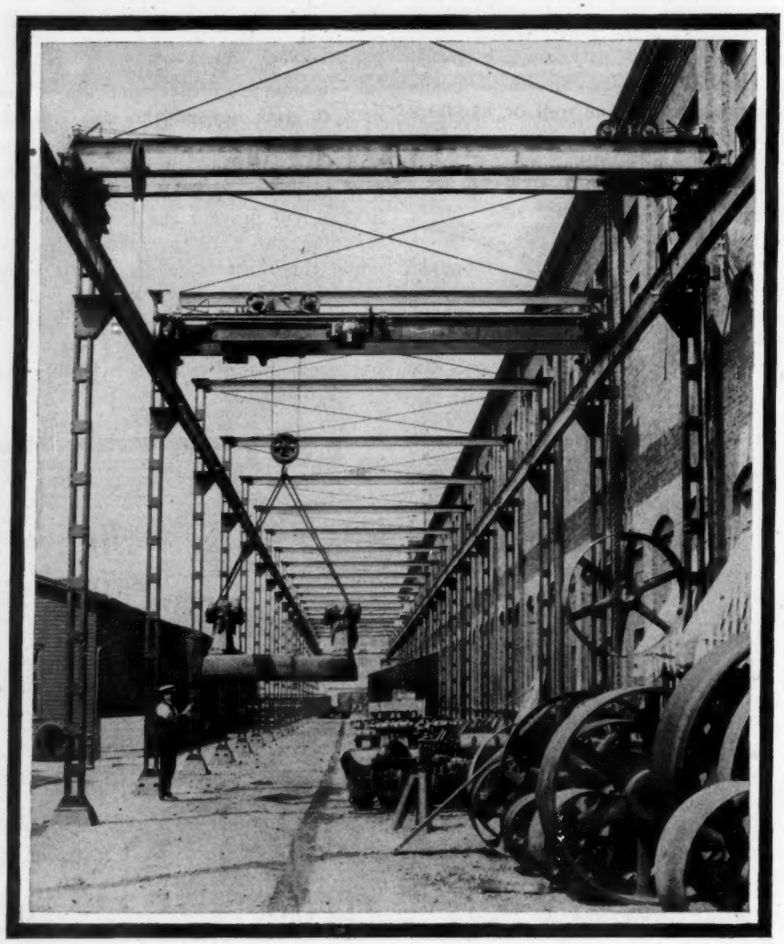


FIG. 8.—HOIST ON MOTOR-DRIVEN BRIDGE FOR STORE YARD.

FIG. 9.—TRAVELING ELECTRIC HOIST FOR COAL HANDLING; BUCKET OPENING FOR LOAD.

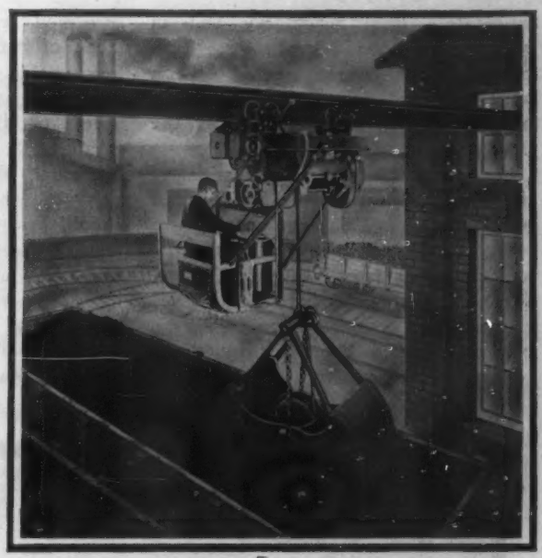


FIG. 10.—TRAVELING ELECTRIC HOIST FOR COAL HANDLING; BUCKET TAKING LOAD.

room. The same objections which apply to the handling of long structural material exist in the handling of pipe, that is, its bulky and inconvenient shape and also its deflection when suspended at the middle or near the ends. In the illustration, a hoist of the same type as illustrated in Figs. 2 and 3 is mounted on a transfer bridge, which is motor-driven. The drive of the transfer bridge is under the control of the hoist operator, and can be moved up and down the length of the building to points opposite a number of lateral monorail runways, covering the pipe storage space. Suspended from the hook of the hoist is a spreader bar with slings at the ends for handling pipe in the same manner as structural material is handled by the hoist in Fig. 3. This system is extremely flexible, as transfer bridges and hoists can be added indefinitely as needed, thus permitting indefinite expansion of the system and almost unlimited capacity for handling material.

The photograph, Fig. 5, illustrates an application of the hoist, which is useful where heated materials, such as ladles of molten metal, hot sheets or plates, etc., are to be handled. The operator in this case walks along the floor with the hoist, which is fitted with an outrigger carrying a handle, which transmits the different motions to the controller. This enables the operator to control the different motions of the hoist without danger to himself and without any great inconvenience from the heat. The operating handle and mechanism is designed, so that a rotary movement operates the traversing controller through the chain and bevel gears shown, while a movement in a vertical direction operates the hoist controller. The traversing controller, after being turned to start the trolley remains in that position until returned to the off-position by the operator, or until the projecting lever is struck by a knock-out pin suspended by the angle-iron supports attached to the runway. The application of the hoist fitted with an outrigger in this manner is particularly adapted to foundries and to mills where it is necessary to handle hot sheets and plates.

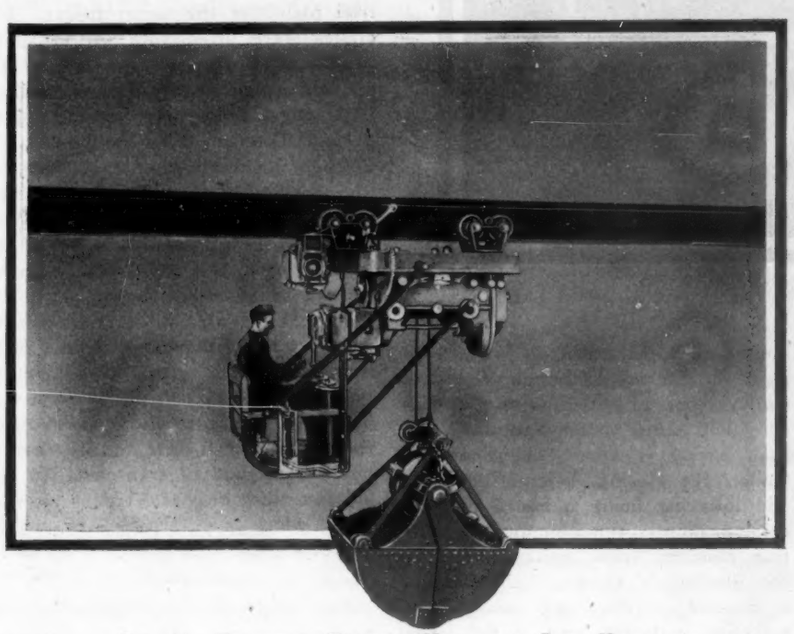


FIG. 11.—TRAVELING ELECTRIC HOIST FOR COAL HANDLING; BUCKET LOADED.

Fig. 8 shows a 6-ton hoist mounted upon a motor-driven bridge and used to handle stock in the stockyard of the Sprague Electric Co. This is one of the instances in which the hoist assumes practically all the functions of a large traveling crane, with the exception that it is operated from the ground by means of pendant switches instead of by an operator riding at one end of the bridge. In the immediate foreground is an adaptation of the hoist, which could be used effectively to fill the office of a traveling crane in a small shop building

moderately light machinery and in comparatively small quantities. This consists of a worm geared, ¾-ton hoist mounted upon a bridge driven by means of a hand chain from the floor.

Fig. 6 is a further adaptation of the electric hoist to the handling of long sheets. This equipment was built and installed in a rolling mill and comprises two spur-geared, 2-ton, 4 rope hoists suspended from I-beam runways and connected together by a pair of angles. The armature shafts of the two hoists are joined by a rod and a pair of universal joints to insure equal speed in hoisting and lowering on the two hooks.

A somewhat similar installation is shown in Fig. 7, which was built to handle skips loaded with small material in a manufacturing plant. This apparatus consists of two 3-ton, 2-rope, worm-geared hoists suspended from swivel trolleys, one of which is motor-driven, the worm shafts being connected to secure equal hoisting and lowering speeds of the hooks. The controllers in this equipment are furnished with operating levers instead of handles and the swivel trolleys enable the machine to traverse curves of narrow radius. The lifting speed of this particular equipment is about 25 feet per minute.

Figs. 9, 10 and 11 show an application of the electric hoist, which should prove of great service in power plants and coaling stations. This is known as the grab bucket monorail crane, and is designed to handle coal and ashes to and from cars and boiler plants or storage piles. The grab bucket is suspended from a hoist, which, in turn, is suspended from the runway by a pair of swivel trolleys, one of which is motor-driven. The entire manipulation of the grab bucket is secured by one controller, the closing, hoisting, opening and lowering being obtained on successive points, thus eliminating friction clutches, loose pulleys, etc. In the illustration shown, the controller is mounted in the cage, the operator traveling with the load in this cage. This, however, is not necessary, as the controller may be placed at a remote point irrespective of the location of the hoisting apparatus. The hoist shown in Figs. 9, 10 and 11 is fitted with a device to prevent the bucket from twisting, but, on ordinary types of apparatus, this is accomplished by means of a tail-rope on the bucket. The trolley in this case has a maximum full-load speed of 350 feet per minute, it being also controlled by a controller in the cage.

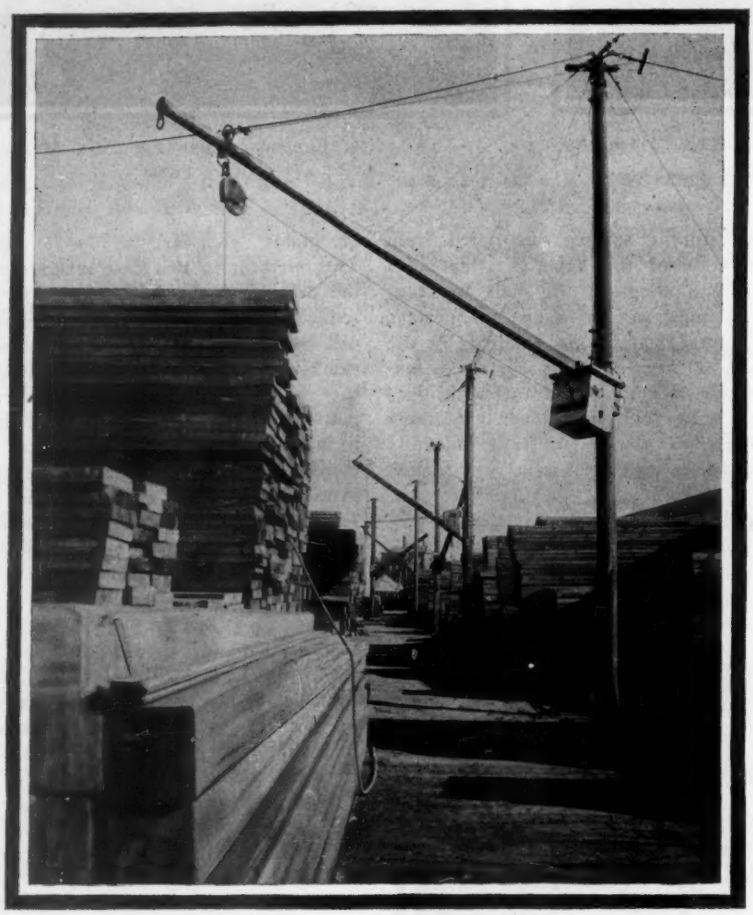


FIG. 12.—APPLICATION OF ELECTRIC HOISTS TO A LUMBER YARD.

An interesting installation of the electric hoist is at the power station of one of the Lackawanna Railroad Co.'s collieries and is used for handling the ashes from the boiler plant. With this equipment, ashes are shoveled into cans in the boiler room, which are then attached to the hoist hook. A man in the boiler room throws a switch and the hoist raises the ashes to a predetermined height and the hoist motor stops. The traverse motor immediately starts conveying the ashes outside the building to a point on the dump where a trip overturns the ash can and then reverses the traverse motor, bringing the hoist back to a point just outside the boiler room where a pin on the runway automatically throws the switch of the traverse motor, bringing the whole mechanism to rest. All this is accomplished without any attention on the part of the operator further than throwing the first switch.

Fig. 12 shows an application of the hoist, which, while designed for use in a lumber yard, for handling long sticks of timber, may be modified to suit conditions in a number of industrial plants in the metal trades. Jib cranes were fitted with ½-ton spur-geared hoists operated by means of pendant cords, which will be seen hanging alongside the mast in the foreground. The rope from the hoist is led through a sheave on the end of the jib, permitting the picking up of pieces at long distances from the hoist. The hoist itself was boxed up by the owner to prevent damage from contact by stocks of timber.

The above are but a few of the many varied applications of the electric hoist. Its great advantage is the wide flexibility possible in its use as instanced by the above installations. It is safe to say that it offers a method of transportation for all but the heaviest types of material, which is unsurpassed by any of the older and better known methods.

The Alabama City stack of the Southern Steel Co., Birmingham, Ala., was out of blast 19 days during June for repairs.

MATERIAL FOR AUTOMOBILES[1].

By Elwood Haynes.

Since the first attempt to build automobiles, early in the 90's, experimenters have had difficulty in getting materials suitable for the purpose. Steel of high tensile strength was employed but the results were never the same. Lower carbon steels were tried, but they lasted only a few weeks or months and then broke short off. Swedish iron did not break, but when the first hard bump was encountered it took a set and the wabbling rear wheels indicated what had happened. Finally a steel of moderately low carbon was introduced which gave only fair results, and if the car was driven for any length of time over rough roads, this also crystallized and broke off.

Nickel Steel.

In 1899 a nickel steel axle was introduced into a machine by Messrs. Haynes & Apperson, and the car made successfully a trip from Kokomo, Ind., to New York, a distance of about 1,000 miles, without serious breakage of any kind. This axle was made by the Bethlehem Steel Co., of Bethlehem, Pa., and so far as is now known, was the first material of this kind ever introduced into an automobile. Nickel steel was used in the axles of cars of this construction for about five years, and not a single case of breakage occurred during that period. Not only was this steel found to be practically free from crystallization, but it possessed a very high elastic limit—about 70,000 or 80,000 pounds—and a tensile strength of over 100,000 pounds, with an elongation of 15 to 20 per cent.

Soon afterward nickel steel was introduced into the construction of driving chains and showed great superiority over those formerly made of ordinary steel. When the sliding gears were first used on the automobile for the purpose of changing the gear ratio between the motor and rear axle, trouble again asserted itself in breakage. In vain were gears made of the best form of tool steel; the ends of the teeth would break off when an attempt was made to throw them suddenly into engagement by means of the shifting levers. Trouble of a very serious nature resulted from this as pieces of the broken teeth would get into the other gears, thus causing them to break, and sometimes the entire train of gears would be almost ground to pieces on account of the breakage first of one gear and then of another.

Nickel Chrome Steel.

Machinery steel, case hardened, was tried, and while this gave better results, it was by no means satisfactory. The injury and breakage of sliding gears were taken as a matter of course, and almost every person possessing a car equipped with these gears expected sooner or later to make a number of replacements.

It was finally discovered that an alloy consisting of iron, nickel, and chromium possessed most remarkable properties. Not only could the steel be hardened by heating to redness and quenching in oil, but it could be given a considerable amount of toughness at the same time by drawing the temper somewhat aften the first hardening. If the steel was properly made and afterward properly treated it was found to be almost impossible to break one of the teeth in a 6-pitch gear by means of a heavy hammer. So successful were these gears that they rendered it possible to run an entire season sometimes without the breakage or serious injury of a single tooth. Front axles, steering knuckles, and other important parts requiring high elasticity were made of this steel in certain cars with very good results.

Alloy Tool Steel.

The greatest difficulty encountered by the manufacturer was in the working of the steel, which was found to be extremely difficult. Fortunately, about the time of its early introduction a tool steel was discovered which possessed most remarkable properties. This steel consists mainly of an alloy of tungsten, chromium, and iron, with but a very small per cent of carbon. One of the most remarkable properties of this steel is its capability of becoming very hard and tough when quenched from a glowing white heat by dipping into a bath of oil. This method of tempering would ruin ordinary tool steel, but it produces in the tungsten chromium steel a substance which is capable of cutting the hardest forms of nickel steel and nickel chromium steel with comparative ease. While this alloy tool steel is not used in the actual construction of the automobile, it is referred to because its use is essential in the turning and machining of the high strength alloy steel.

It has been found that the manufacturing and working of nickel chrome steel requires great care, as there seems to be some tendency toward segregation when the steel is in the process of making, which gives rise to hard and soft spots in the finished metal. If an attempt is made to manufacture gears from material of this character, it will be found that some of the teeth are extremely hard while others are just about the right hardness. On the other hand, even if the steel is of uniform composition and texture throughout, it will not stand very great variation of temperature without danger of injury, since it is very sensitive to heat treatment. When properly made and properly treated, however, it is perhaps the most resistant substance yet produced so far as the resisting shocks and blows is concerned. It has been found almost impossible to break a tooth from a 6-pitch gear made from this material, even with the use of a heavy hammer. This renders it especially suitable for sliding gears which are subjected to the destructive action due to the striking of the teeth when forced into mesh while in motion.

The following may be taken as a test of high quality nickel chrome steel made by the Krupp company of Essen, Germany. It will be noted that much depends upon the treatment of the steel.

Table I.

DIMENSIONS OF TEST BARS—5.91 INCHES LONG AND 0.59 INCHES DIAMETER.

	Normal	Slightly hardened	Greater degree of hardness
Elastic limit, lb. per sq. in...	86,909	148,072	193,589
Tensile strength, lbs. per sq. in.	111,943	155,326	221,325
Elongation, per cent	14.5	9.1	7.7
Contraction, per cent	64.0	55.6	46.2

It will be noted from the above tests also that under the hardening treatment the tensile strength rises rapidly, and the same may be said of the elastic limit, rising as it does from 86,909 pounds to 148,072 pounds when slightly hardened, while the tensile strength rises from 111,943 to 155,326. With a greater degree of hardness the elastic limit reaches 193,589 and the tensile strength 221,325. It will be also noted that the elongation gradually diminishes from 14.5 per cent in the normal steel to 7.7 per cent in the more highly hardened specimen. The contraction of area also falls from 64 per cent in the normal to 46.2 per cent in the highly hardened steel. The contraction of area does not suffer so much, as the elongation. The comparatively small loss in contraction of area is a good sign, since it indicates that the texture of the steel has been well preserved under treatment.

Plain nickel steel containing a very small per cent of carbon is also a good safe material for automobile work. The following may be taken as an example of a mild low carbon nickel steel:

Elastic limit, 65,146; tensile strength,

[1]A paper presented at the Indianapolis meeting (May, 1907) of the American Society of Mechanical Engineers.

81,561; elongation, 23.9 per cent; contraction of area, 71 per cent.

It will also be observed from this that while the elastic limit is quite low as compared with the nickel chrome steel, it is high as compared with ordinary carbon steel and that the elongation and contraction of area are very high indeed, indicating a very safe material for almost any construction. This material not only possesses these excellent properties, but resists dynamic stress remarkably well—in fact if the dynamic stresses are not too close to the elastic limit of the steel, it will preserve its strength and quality for an indefinite time. The following tests indicate the quality of this material as compared with carbon steel:

Carbon steel, 15,000 vibrations; nickel steel, 34,000,000 vibrations.—(Not broken).

The former shows the carbon steel under combined torsion and vibration, and the latter nickel steel under the same test. It will be observed that whereas the carbon steel withstood only 15,000 vibrations, the nickel steel was not broken under 34,000,000 vibrations.

Vanadium Steel.

Besides the steels already mentioned, there is another which is now attracting considerable attention; namely, that produced by adding a small quantity of vanadium to a nickel steel or chrome steel. Since vanadium has until recently been classed among the very rare elements, it may perhaps be in place to mention a few of its properties; it is prepared from the chloride V Cl_2, which is reduced by means of a current of hydrogen gas, the chloride being heated while the reduction is taking place. Simple as this process may seem, it is one of the most difficult known to chemists, and it usually requires three or four days to prepare a fraction of an ounce of the metal by this process. Until quite recently this element and its compounds, owing to their rarity, were very expensive, but we are now assured by the American Vanadium Co. that a sulphide of vanadium has been discovered in an immense quantity in the Andes mountains of South America, and that it is now prepared to furnish the metal in the form of a ferro alloy known as ferro-vanadium in any quantity desired.

This ferro vanadium contains about 20 per cent of the latter metal and is readily incorporated with the iron or steel during the melting, either in the open-hearth or crucible process. Mr. J. Kent Smith, who has given the subject of vanadium steel much attention, advocates the open-hearth process as preferable to the crucible process for the making of this steel. This steel possesses most remarkable qualities, notwithstanding the small quantity of vanadium which it contains. One of these is the closeness with which its elastic limit approximates its tensile strength, and since the former quality is the one in which the greatest dependence is placed, this is a very desirable characteristic. The sharp contraction of area, also a characteristic of this steel which together with the silky fracture it usually presents, is also a strong indication of the splendid quality of this material. Moreover, the fracture is nearly always of this quality, even though the steel has been highly tempered.

It is a rather remarkable fact that the vanadium alone or with carbon does not give much character to the iron or steel, but when a third element is introduced, such as nickel or chromium, the characteristics of the steel are changed for the better. Whether the vanadium acts as an essential element in the composition of the steel or principally as a purifier is not fully known; it has been found, however, that a certain amount of the vanadium introduced (about ¼ per cent), must remain in the steel in order to give it its characteristic properties. Vanadium, however, has a strong affinity for nitrogen as well as for oxygen, and it may be that it acts as a purifier of the steel by combining with minute quantities of nitrogen gas, which might otherwise be occluded in the steel and thus interfere with its compactness and strength.

It will readily be seen that the high elastic limit, strong contraction of area and splendid silky fracture, together with the large number of vibrations which the steel endures under dynamic stress, most strongly recommend this steel as almost ideal for many parts of the motor car. The writer has made some experiments on the foregoing, and found that it works well under the hammer, though it must not be allowed to become too cold or it will resist pounding to a remarkable degree. It is not readily injured under the forging hammer, provided due care be taken not to heat it too rapidly. Another valuable property of the steel is the fact that it machines more readily that nickel chrome steel—in fact, more readily than plain nickel steel.

Bronze.

The use of bronzes in the motor car must necessarily be restricted to parts requiring low rigidity, and usually also moderate strength. While it must be admitted that samples of bronzes can be made that approach closely to fairly good grades of steel in tensile strength, elastic limit, and contraction of area, it must be remembered that the modulus of rigidity of iron and steel is about 28,000,000, for example, while that of bronze is only about 15,000,000. This means that a bar of bronze of a given size and form under given conditions will deflect twice as much under the same load as a similar bar of iron or steel. In most parts of the car this feature is objectionable, since changes of alignment are likely to occur, unless the parts which are made of this material are especially well designed.

Notwithstanding the above objection the readiness with which bronze lends itself to the production of castings of various parts, and its freedom from crystallization under dynamic stress has led to its introduction into many of the minor parts of the motor car, such as small hand levers, carburetors, tubing, crank cases, gear cases, etc. In general, it may be said that it is suitable for the small levers such as those used for controlling the sparking mechanism, carburetor, etc. Another use for this metal is in bearings, although these require a decidedly different composition from that used for levers, crank cases, and like parts.

The parts requiring strength are usually made from nickel bronze, phosphor bronze, manganese bronze, or aluminum bronze, while the bearing bronzes are composed usually of lead, tin, and copper in various proportions. Under this latter head come also the so called babbitt metals which vary greatly in their composition, some of them being composed of lead, copper, tin and antimony; others of lead, tin, zinc, and antimony, and still others of lead, tin, and antimony. It is not the purpose of the writer to discuss the merits of these various bearing metals, since a number of very good ones can be readily obtained on the market.

Beside the above alloys, pure copper is used to a considerable extent in the construction of radiators, gasolene tanks, etc. It is well adapted for the construction of radiators, since it can easily be soldered; is one of the best conductors of heat, and is readily formed into almost any shape on account of its malleability, ductility, and comparative softness.

Aluminum.

Aluminum is now used very largely in automobile construction, and it is a significant fact that it was first introduced into the automobile in America, though the French used it to some extent quite early for a few minor parts of their machines. Pure aluminum is used only for a few special purposes, and even then to a limited extent—most notably for tubing and radiators.

It is quite well adapted for the latter purposes in many respects, but the comparative difficulty experienced in soldering it is somewhat of a drawback. On the other hand, when alloyed with copper or some other metal giving it increased hardness and elasticity, it is well adapted for various purposes such as seats, gear cases, crank cases, dashes, and various other parts of the car. Its extreme lightness, together with the ease with which it may be machined and the facility with which it may be cast, renders it very useful for many parts of the machine.

An alloy of zinc and aluminum seems to have considerable rigidity and elasticity, as well as quite high tensile strength. It is also cheaper than the aluminum copper alloy, but experiments made by the writer indicate that this alloy is not safe if subjected to repeated vibrations, since it seems to fatigue quite rapidly and sooner or later breaks off short. For example a ½-inch square bar made of an alloy of aluminum and zinc withstood only about 15,000 vibrations before breaking, while an alloy of copper and aluminum withstood 1,600,000 vibrations of the same amplitude and frequency without breaking or showing any signs of injury except a very slight set. Aluminum also forms a very light alloy with magnesium, which, however, is too expensive for ordinary use and is somewhat difficult to handle in quantity. A number of other alloys of aluminum have been prepared, and to some extent used in automobile construction—the most notable perhaps of which is an alloy of tungsten and aluminum, which has been used to a considerable extent abroad, but is not used in American cars so far as the writer is aware.

From the foregoing it may be said that the following substances have proved suitable for the various parts of the automobile:

a For rear live axles, nickel steel containing from 4 per cent to 5 per cent nickel and less than 0.3 per cent carbon.

b For front axles, steering knuckles, propeller shafts, etc., vanadium steel.

c For sliding gears, nickel chrome steel hardened throughout, or mild nickel steel case hardened.

d For crank shafts, nickel steel or vanadium steel.

e For frames, low carbon open-hearth steel, mild nickel steel or nickel chrome steel

f For nearly all other parts of the car, such as hand levers, tubing, etc., a good open-hearth steel of comparatively low carbon—say 0.4 per cent or under—is of suitable quality, since there is no advantage gained by using high class steels for these purposes for the reason that the rigidity of these parts is of prime importance, and in order to make them sufficiently rigid, they must be made much more than sufficiently strong; therefore, since all steels are practically equal in rigidity, one steel is, broadly speaking, as good as another for these parts.

The use of bronze should be restricted largely to minor parts; the reducing gear wheels, small levers, etc., can be made of phosphor bronze, while the bearings should be made of some good composition bronze—an alloy of copper, lead, tin and zinc answers well for this purpose, but the main bearings for the engine, such as the crankshaft, crank pins, etc., should be made of a special bearing metal, which is very firm and at the same time will not injure the crankshaft in case the lubrication becomes deficient. The crank case of the motor, the gear case, and other similar parts may well be made of aluminum, since it is light, strong, and easily cast into the proper shape. Steel would answer for the above parts if it could be conveniently worked into the proper form.

It will be noticed from the foregoing that the most progressive automobile builders have spared neither pains nor expense in obtaining the very best materials that can be produced, because in order to obtain the highest results in automobile construction, it is necessary that material of superior quality shall be used for certain parts of the machine. Perhaps there is no form of construction that taxes the ingenuity of its builders more severely than the building of a good automobile. Take for example one of the high powered touring cars carrying from five to seven persons and equipped with a motor of 50 horse power. Now consider that this motor is sometimes geared down to such an extent that its direct torque is multiplied ten or twelve fold on the rear axle; consider further that the driver of the machine is often entirely inexperienced, and to a large extent ignorant of the strength of the material and the use of power, and it will be realized that the chances for trouble when driving an automobile are certainly very great.

Now add to the stresses and possible abuses from the foregoing, the severe jolting and jarring of the rough roads in America, and some idea may be formed of the severe ordeal through which an automobile must pass during a season's run. It has been the general experience of builders that the more ignorant the owner of the machine, the greater his complaint. On the other hand, those who are versed in mechanical matters and who know the sizes of parts generally used for heavy stress, often marvel at the strength and endurance of the modern automobile. Factors of safety must be reduced to the minimum in nearly every part of the machine or excessive weight is sure to occur. Many high class machines weigh less than 70 pounds to the horse power, passengers included. Of course it is not expected that the motor shall be used constantly at anything near its maximum horse power—1-10 of its brake horse power is enough for almost any automobile motor when in daily use; high power is simply intended to meet emergencies, but the material throughout the machine must be strong enough to withstand any stress momentarily applied.

The following table gives approximately the strength of various materials used in automobile construction:

Table 2 Strength of Automobile Materials.

	Modulus of rigidity	Elastic limit	Tensile strength
Aluminum alloys	8 to 11 million	10,000 to 15,000	20,000 to 30,000
Phosphor bronze	12 to 14 million	20,000	30,000
Manganese bronze	15 million	35,000	50,000
Aluminum bronze	15 million	50,000	75,000
Wrought iron	28 million	30,000	40,000
Mild open-hearth steel	28 million	40,000	60,000
Tool steel	29 million	80,000	110,000
Nickel steel	28 million	80,000	110,000
Nickel Chrome steel	30 million	160,000	180,000
Vanadium steel treated	30 million	220,000	228,000

All of the above materials stand well under dynamic stress with the exception of the tool steel, which should not be used for this purpose.

Steel Construction Firm.—John W. Hamilton and Herbert J. Chambers have formed a partnership to engage in steel construction work, with offices at 29 Broadway, New York. Mr. Hamilton was for 12 years connected with Milliken Bros., until the appointment of receivers, as contracting manager. He is a member of the A. S. C. E., the Engineers' Club, the Brooklyn Engineers' Club, the Transportation Club, the American Asiatic Society, and other organizations. Mr. Chambers is also a member of the A. S. C. E., and the Transportation Club. He was contracting engineer for Milliken Bros., being connected with that concern for seven years.

THE FOUNDATION COMPANY SUCCESSFUL IN SAVING THE SYRACUSE SHAFT AT BIWABIK

The difficulties encountered in putting shafts down at the Syracuse and Bangor mines on the Mesabi range have been much commented upon. The following description of the operation by the engineer in charge has just been prepared. These shafts have awakened interest owing to the extreme difficulties overcome and the somewhat novel application of the pneumatic process for this particular class of construction.

The history of the previous efforts to put down the Syracuse shaft is a two-year record of disappointment and expenditure of money. The ore body is situated adjacent to and running under Embarrass Lake, a body of water of considerable size, which surrounds the ore body on two sides. Immediately on top of the ore deposit is 45 feet of treacherous quicksand and owing to the proximity of the lake the ground is saturated with water and it is particularly difficult to sink a shaft through it by any ordinary process.

The mining company realized this before beginning operations and Pickands, Mather & Co. made an arrangement with the patentee of a method of sinking open shafts through water-bearing material to adopt this method and employing him to superintend the work. They began operations in December, 1904. The method as here applied consisted of a series of cofferdams driven inside each other, the first one being sufficiently large to provide space for the other dams inside of it; 18 feet wooden staves or sheet piles were then driven down around two sets of walling timbers, and the excavation started inside the staves.

The first cofferdam was built and the excavation and pumping was started inside of it. Very slow downward progress was made, however, as the flow of water and sand was too great for the pumps to handle. The next set of staves was started but landed on top of a bed of large boulders and could not be forced down. By this time four No. 10 Cameron pumps could not handle the inflow of sand and water, and it was apparent that the work could not be successfully accomplished by this method. After a four months' trial the mining company decided to stop all operations at this point, and to change the location of the shaft to a point some two hundred feet south from the abandoned one. Here the overburden is some fifty feet greater but the chance of encountering boulders was considered much slighter.

The permanent mining plant which had already been installed was accordingly moved to the proposed site. As this plant had to be taken up a steep hill, moving it entailed considerable expense.

At the new site, the mining company with its own force sank a large timber shaft to the quicksand (about 50 feet) by the method commonly employed on the Mesabi range. This consists of suspending sets of timber about 3 feet apart from the surface and as the excavation proceeds 2 inch by 10 inch planks 4 feet long are slipped in back of these timbers, forming a comparatively tight wall to keep out the soil. Each course of walling timbers, or each set as it is called, is suspended from the set of timbers immediately above it by 1¼ inch bolts, the top set of timbers in turn being connected in a like manner to large round timbers on the surface, called bearing timbers, which span the excavation and carry the weight of the shaft until it rests on the bottom.

From the surface of the quicksand it was the intention to drive steel sheet piling to the ledge. The shaft was accordingly built large enough to permit a steel sheet pile cofferdam at the bottom of and inside the timber shaft. Work was started on driving the steel sheet piling in November, 1905, and continued until the following spring.

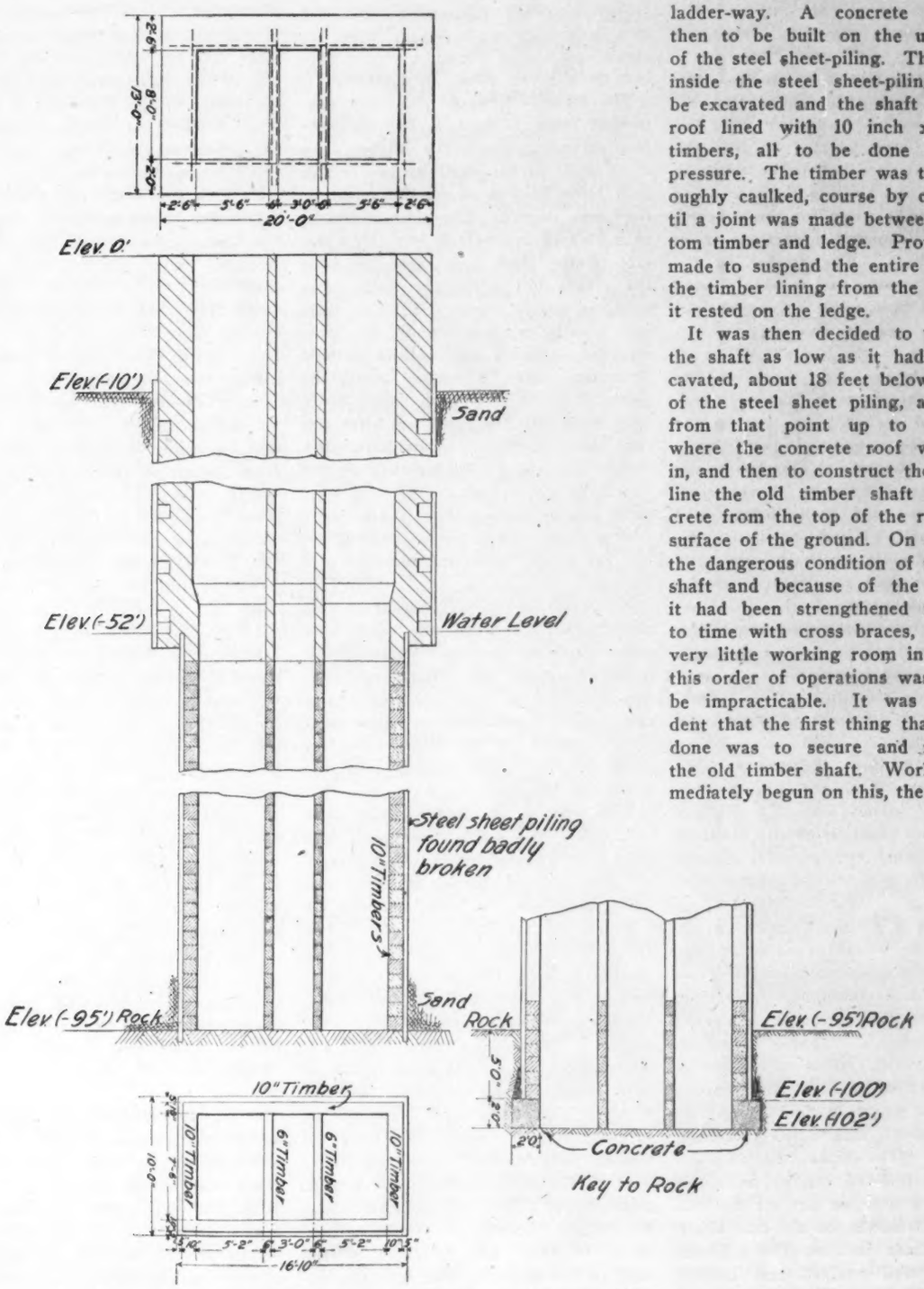
The piling was driven with an ordinary pile driver derrick which rested on the timber shaft at the surface, and was sent home by means of a special follower designed by the manufacturers of the steel piling. A 3,000-pound hammer was used and at one period of the work a water jet was also employed to assist the work of the hammer. The piles were driven very hard and were of the heaviest section turned out by the manufacturers.

After the pile cofferdam was completed a No. 10 Cameron pump was installed and the excavation started inside the steel piling, walling pieces and struts being introduced about every three feet as the work progressed, to keep the piles in place. The excavating was accomplished without much difficulty to a point about 20 feet below the top of the piles. Below this point it proceeded very slowly. After taking out a few feet of material the quicksand would suddenly start to boil up from the bottom, accompanied by a corresponding movement of the material on the outside of the shaft. This badly distorted the timber shaft and cracked the timbers.

It became evident to those in charge that there must be a bad leak or break in the steel sheet piling and means were at once adopted to overcome this difficulty. A crib of 10 inch x 10 inch timbers 3 feet high was built at the bottom of the excavation inside the shaft, the intention being to load this crib and force it down with the hope that it would overlap the leak or break in the piling, and that then the work could be prosecuted successfully. The crib was forced down a few feet but there it stuck and very little if anything, was gained by the scheme. In the meantime each period of excavation was followed by an upward boiling of the quicksand at the bottom. The material around the outside of the shaft settled away leaving the upper part of the shaft exposed. Hay, straw, etc., were placed outside the shaft with the hope that at each settlement of the sand, this material would be carried down outside the steel piling and utimately stop the leak in it.

At this stage it became necessary to support the timber shaft as it had broken away from the bearing timbers at the surface, and was settling down and telescoping the steel cofferdam. This was accomplished by stretching railroad rails and timbers across the top of the cofferdam and under one of the sets of timber of the wooden shaft, allowing the timber shaft to take a bearing on them. Pumping was then resumed and pieces of sheet iron were forced down alongside the sheet piles and every effort was made to locate and stop the holes where the quicksand was entering the shaft. As a last resort grout was pumped down to the ledge through a two-inch pipe, which was withdrawn and moved frequently. This was allowed time to harden and the

excavation was resumed. After advancing a few feet, the sand and water broke in from the bottom and boiled up as usual. On the first of August it was decided that the shaft could not be sunk by ordinary methods, and the work was turned over to the Foundation Co., New York, which devised plans and contracted to put the shaft down to and far enough into the ledge to make a watertight joint with the rock.



CONSTRUCTION OF SHAFT AT SYRACUSE MINE.

The Foundation Co. began operations early in October, 1906. Its plan was to line the upper or timber part of the old shaft with reinforced concrete, leaving a shaft 13 feet 6 inches x 6 feet 1 inch and having two hoisting compartments 4 feet 6 inches x 6 feet 1 inch at each end, and one compartment 6 feet 1 inch x 3 feet 6 inches in the center for a pipe and ladder-way. A concrete roof was then to be built on the upper ends of the steel sheet-piling. The material inside the steel sheet-piling was to be excavated and the shaft below the roof lined with 10 inch x 12 inch timbers, all to be done under air pressure. The timber was to be thoroughly caulked, course by course, until a joint was made between the bottom timber and ledge. Provision was made to suspend the entire weight of the timber lining from the roof until it rested on the ledge.

It was then decided to pump out the shaft as low as it had been excavated, about 18 feet below the tops of the steel sheet piling, and timber from that point up to the point where the concrete roof was to go in, and then to construct the roof and line the old timber shaft with concrete from the top of the roof to the surface of the ground. On account of the dangerous condition of the timber shaft and because of the fact that it had been strengthened from time to time with cross braces, which left very little working room in the shaft, this order of operations was found to be impracticable. It was very evident that the first thing that must be done was to secure and make safe the old timber shaft. Work was immediately begun on this, the first thing done being to transfer the weight of the shaft from the tops of the sheet piles to the surface of the ground. This was accomplished by putting in

some extra heavy bearing timbers 60 feet long across the top of the shaft at the surface. The old shaft was connected by twelve 1¼ inch bolts to these timbers. The cross timbers and rails on which the shaft formerly rested were then cut out and the shaft was again suspended from the surface.

A space two feet in length was now cleared of bracing, broken struts, etc., at the bottom of the timber shaft and a concrete form started to line the shaft. Great care had to be taken in cutting out and shifting the struts and braces to make room for the concrete which was deposited in sections about two feet high. The timber in the shaft was cracking and moving a good deal of the time while this work was being done and it was hard to get men to stay in the shaft. A few of the cross braces were concreted in and after the concrete had set were cut out and the ends dug out of the concrete, the resulting space being filled with concrete. This work necessarily proceeded very slowly, temporary braces and jacks being used and continually shifted. Then, too, the scarcity and poor quality of the only labor to be had contributed to the slow progress of the work. On Nov. 9, the concrete lining had reached a point 10 feet from the top of the shaft and it was then considered to be in a perfectly safe condition.

Horizontal reinforcing rods ⅝ inches square, spaced 12 inches center to center, vertically, were used in the concrete lining. A recess 6 inches x 18 inches was left one foot from the bottom of the side and end walls to permit the concrete roof to be keyed into them.

The shaft was then pumped out to the sand, about 18 feet below the bottom of the proposed concrete roof, and the work of lining the shaft from this point to the bottom of the roof with 10-inch x 12-inch timbers was commenced. This also was a ticklish piece of work as the bracing then in the shaft at this point had to be removed and solid timbering substituted. The sides and ends of the shaft were lined, starting from the sand, one course or set of timbers resting immediately on the one below it. The joints between the different sets were well caulked and hawsed with oakum.

The shaft was braced transversely by two solid walls of 6-inch x 12-inch timbers, each placed 1 foot 2 inches from the center of the shaft. These also served as dividing walls and subdivided the shaft into three chambers thus: A skid-way at each end 4 feet x 6 inches x 6 feet 1 inch and a pipe and ladder-way 6 feet 1 inches x 3 feet 6 inches in the center. In the four corners of the shaft were 3½ inch x 3½ inch and ½ inch angles bolted to each set. These secured and braced the ends of the timbers in a most satisfactory manner.

The form of the roof was then suspended from 12 inch x 12 inch timbers extending across the finished concrete walls of the shaft by twelve 1½ inch bolts, and work on the concrete roof was started. The roof consisted of a slab of concrete 5 feet thick the size of the shaft and extending into the recess left when the lining was built, as before mentioned. The roof was heavily reinforced with 1¼ inch steel bars running horizontally in both directions about 6 inches center to center. Eight 1¼ inch steel bolts were built into the roof, and after the roof had hardened sufficiently, the weight of the timbering below the roof, which was built in the sand bottom, was transferred to these bolts so the sand could be excavated below the timber without danger of settlement.

A section of 48 inch air shaft had also been built into the roof, and when the concrete had attained sufficient hardness this shaft was continued up to a point 30 feet above the roof. A Moran air lock was then connected to the top of the air shaft and air was turned into the shaft Dec. 18, 1906.

The work of excavating the shaft and lining the steel sheet piles was carried on rapidly for 12 feet although the old crib or timber lining which was previously mentioned had to be cut out and sent to the surface. All the timber lining was lowered through the air lock and shafts from the surface where it had previously been framed. As each stick was put in place it was suspended from the timber above it by 2¼ inch x ½ inch iron straps 24 inches long fastened to each timber by two 7 inch x ¾ inch lag screws. After ten courses of timber were suspended in this manner, an iron strap of the same dimensions except that it was enough longer to engage ten sticks of timber instead of one, was fastened to the wall in the same manner and the upper end of the roof bolt as a necessary precaution.

The size of the finished shaft inside of the steel sheet piling was somewhat smaller than was anticipated, and for the first 25 feet of this work there was a space of from 3 inches to 6 inches between the timber lining and the steel piling. This space was filled with rich concrete. As this had to be suspended from the roof as well as the timbers, and had to be put in from the bottom instead of the top, it was found to be somewhat difficult. However, the general line of the steel piling slanted toward the center of the shaft and it was not long before the space enclosed by the piling was none too large to receive the timber lining.

At this point, 12 feet down, it was discovered that four of the sheet piles had landed on a bowlder, and had been deflected from their course and, as they were further driven, curled up inside the shaft in almost true circles of from 4 feet to 6 feet diameters. These were cut off with pneumatic tools and sinking resumed. On account of the large space left open for the escape of air, caused by cutting out these four piles, and the peculiar nature of the ground, great difficulty was experienced from this point downward to the ledge. It was almost impossible to keep the water and quicksand low enough to get in a set of timbers. In a good many cases this could only be accomplished by the aid of jacks and an air jet.

More steel sheet piles were encountered as sinking progressed, piles that had broken away from the general line of the piling and had been forced into the shaft area. Some of them had to be cut several times as the excavating and timbering proceeded. In all 143 cuts were made in the steel sheet piles. This, of course, was slow work as a good many of them had to be cut out 14 inches under the surface of the sand and water to allow for placing the timbers.

The work was further retarded by a fire caused by the flame of a miner's candle, and by breaking down of an air compressor, both happening at different times, and it was not until March 12, 1907, that the ledge was reached.

It was the intention of the contractor to stop the shaft at the ledge and, after making a tight joint with the same, turn it over to the mining company, but in reaching the ledge it was found to be so badly broken up and seamy that it was finally decided to carry the excavation under air into the ledge. After going into the ledge 12 feet, it was thought best to stop further sinking under air pressure and finish the shaft in the open. Accordingly a tight point was made with the ledge and air was taken off

on May 10. The walls of the shaft were found to be tight and in good condition. Very little water came in and that only in the center of the ledge.

The contractor had a complete equipment of modern appliances for the work, consisting of air compressors, pneumatic tools, electric light plant, etc., besides other plant devices of which the Foundation Co. controls the patents. Very little if any headway could have been accomplished without these aids. The work was done under the direction of F. W. Adgate, A. M. Am. Soc. C. E., superintendent of the Foundation Co. and so completely successful has the undertaking been that the Foundation Co. will undoubtedly be called upon wherever similar difficulties seem probable of being encountered.

MINING ENGINEERS AT TORONTO.

The next meeting of the American Institute of Mining Engineers will be held at Toronto, July 23 to 29. Among the papers which will be read are the following:

Some Reflections on Secrecy in the Arts, by James Douglas, New York City; Coal Briquetting in the United States, by E. W. Parker, Washington, D. C.; The Electric Air Drill, by W. L. Saunders, New York city; Zinc Oxide in Iron Ores and the Effect of Zinc in the Iron Blast Furnace, by John J. Porter, Cincinnati, O.; Blow Holes in Steel Ingots, by E. von Malitz, South Chicago, Ill.; Pure Coal as a Basis for the Comparison of Bituminous Coals, by W. F. Wheeler, Urbana, Ill.; The Production of Converter Matte from Copper Concentrates by Pot Roasting and Smelting, by George A. Packard, Boston, Mass.; Notes on the Present Source and Uses of Vanadium, by J. Kent Smith, Pittsburg, Pa.; discussion of paper by H. M. Howe on Piping and Segregation in Steel Ingots, by Alfred C. Lane, Lansing, Mich.

An action has been brought by the Toronto Roller Bearing Co., Toronto, Ont., against Standard Bearings Ltd., which is the successor of the former Henderson Roller Bearings Co., re-organized in February, 1905, as the Standard. The Toronto Roller Bearing Co. controlled the patents held by the Henderson Co. and now applies for an order setting aside the re-organization agreement on the ground of fraud and misrepresentation. It also asks the surrender of the patents and the transfer of 2,000 shares of stock held by the Toronto company in the defunct Henderson Co.

BRICK IS BRICK

AND UNIFORM RATES MUST BE CHARGED.

Important Decision by the Interstate Commerce Commission of Interest to Iron and Steel Companies.

An important decision has been rendered by the United States Commerce Commission in a case in which the Stowe-Fuller Co. was plaintiff and the Pennsylvania R. R. Co., the Pennsylvania Co. and the B. & O. R. R. Co. were defendants. Its significance is discussed editorially in this issue. The decision was as follows:

1. Complaint in this case was directed solely against present differences in defendants' rates on fire, building and paving brick from Empire, Strasburg and other points in Ohio to New York city and other eastern destinations, but no attack was made upon the reasonableness of the rates on either kind of brick except as involved in the claim that any difference in the rates for the different kinds is unlawful: Held, Upon the facts and circumstances of the case, that no such distinction between these three classes of brick, which are made of the same material, come out of the same kiln, are nearly alike in color, and are of the same size and weight, exists as justifies a difference in rates. To hold otherwise would be to promote false billing by the shippers and to require carriers to make a practically impossible examination into the use to which each shipment of these brick was put.

2. Classification must be based upon a real distinction from a transportation standpoint. Aside from the difficulty in learning what use the brick were to be put to upon reaching their destination, the commission can not regard a classification as scientific, or a difference in rates as well based, which is altogether founded upon a distinction that has no transportation significance. Such a differentiation, if permitted and extended throughout the various classes of freight, would lead to an almost endless multiplication of rates, which could find no excuse save the use which might be made of the article transported.

The report of Mr. Lane, for the commission, follows:

Report and Order of the Commission.

The complaint herein is directed solely against the present differences in rates charged by defendants on fire, building and paving brick from Empire, Strasburg and other shipping points in Ohio to New York and other eastern destinations, and the complaint is based upon the contention that for transportation purposes the three descriptions of brick constitute like traffic and should take the same rate. No attack is made upon the reasonableness of the rates on either kind of brick except as involved in the claim that any difference in the rates for the different kinds in unlawful.

Complainant owns or controls five plants for the manufacture of brick out of fire clay, one at Strasburg, O., on the Baltimore & Ohio railroad; one at Empire, O., on the Pennsylvania Co.'s line; one at Olive Hill, Ky., on the Chesapeake & Ohio railway, and one at Lock Haven, Pa., and one at Alexandria, Pa., both on the Pennsylvania railroad. It also purchases brick from other plants. It handled in 1906 about 80,000,000 brick, of which 60,000,000 were of its own production. Complainant is stated in testimony to be the second largest shipper of brick in the United States. The points of shipment mainly involved in the testimony are Empire and Strasburg, in Ohio.

The rates from Empire and Strasburg to New York are based upon the brick rates from Chicago to New York, as indicated in the following history of the rates on eastbound shipments: It appears that about the year 1897 the rate on all brick from Chicago eastbound was 20 cents. This was raised later to 25 cents Jan. 1, 1900. Very shortly afterwards, upon representation of the paving-brick shippers, the rate on paving brick was reduced 2½ cents, and in May, 1900, those shipping building brick having been heard from, the scale from Chicago was made—fire brick, 25 cents; building brick, 22½ cents, and paving brick, 20 cents. About a month later the rate of 22½ cents was made to apply on both building and paving brick. In September, 1904, about four years later, the rates were made 25 cents on fire brick and 20 cents on both building and paving brick.

Strasburg, O., takes 70 per cent of Chicago-New York rates, and the rates from that point to New York are, therefore, 17½ cents on fire brick and 14 cents on building and paving brick, Empire, O., takes the 60 per cent basis, but the Pennsylvania system fixes the rates from that territory on the basis of 22½ cents from Chicago, and the rates from Empire to New York are, therefore, 15 cents for fire brick, 13½ cents for building brick, and 12 cents for paving brick. A similar relation exists on eastbound shipments from other shipping territory on the Pennsylvania lines in Ohio and Pennsylvania for the three grades of brick shipped to eastern destinations. The complainant has been protesting to the carriers against

the application of different rates on these grades of brick for several years.

The rates westbound are on a lower basis and are the same for brick of all descriptions; that is to say, from Pennsylvania brick-making points to all points in Central Freight Association territory the three kinds of brick take the same rate, and that rate is lower than the rate eastbound between the same points. From Williamsport, Pa., a brick-manufacturing point, the rate westbound to Canal Dover (near Strasburg), O., is $1.75 per ton (8¾ cents per 100 pounds), while the rate from Canal Dover to Williamsport is $3.10 per ton, or 15½ cents per 100 pounds.

The defense claims that the $3.10 eastbound rate extends east as far as Philadelphia, while the westbound rate from Williamsport applies from a group of which Clearfield may be taken to be the most westerly point of shipment, and that the comparison is unfair. However this may be, the fact remains that as between Canal Dover and Williamsport the westbound rate on all grades is $1.35 per ton (6¾ cents per 100 pounds) less than the rate on fire brick eastbound.

The rates between points in Central Freight Asosciation territory, which is the transportation territory west of Pittsburg and Buffalo and east of the Mississippi river, are generally the same for the three grades, but to this there are exceptions, some of which are shown in the accompanying table:

Rates on brick in carloads.
[Per net ton.]

To—	From— Empire, Ohio, via Penna. Co.			Strasburg, Ohio, via B. & O.			Portsmouth, Ohio, via N. & W.		
	Fire.	Face building.	Paving.	Fire.	Face building.	Paving.*a*	Fire.	Face building.*b*	Paving.
Chicago, Ill.	$2.20	$1.70	$1.70	$2.00	$1.50	$1.50	$2.00	$1.50	$1.50
Cleveland, Ohio	.95	.95	.95	.65	.65	.65	1.40	1.40	1.30
Cincinnati, Ohio	1.60	1.60	1.45	1.50	1.50	1.20	1.00	1.00	.90
Toledo, Ohio	1.40	1.40	1.10	1.20	1.05	.90	1.45	1.45	1.05
Detroit, Mich.	1.80	1.80	1.40	1.60	1.30	1.20	1.75	1.45	1.35
Evansville, Ind.	2.80	2.80	....	2.60	2.60	2.15	2.50	2.50	2.05
Indianapolis, Ind.	1.90	1.90	1.45	1.70	1.70	1.25	1.70	1.70	1.25
Peoria, Ill.	2.65	2.65	1.95	2.45	2.45	1.75	2.45	2.45	1.75
East St. Louis, Ill.	2.90	2.70	2.35	2.70	2.50	2.15	2.60	2.50	2.05
St. Louis, Mo.	3.10	2.90	2.55	2.80	2.60	2.25	2.80	2.70	2.25

a Paving-brick rates from Strasburg—rates given are from Canton district. Tariffs do not specifically name Strasburg.

b Face building brick from Portsmouth—except to Chicago, Detroit, East St. Louis, and St. Louis no specific rates in force on building brick shown in tariffs, and fire-brick rates are used.

From certain groups in Pennsylvania to points in territory known as Buffalo-Rochester territory the rates via the Pennsylvania lines are the same, and the testimony indicates that the differing rates apply on shipments to Buffalo-Rochester territory from Empire and Strasburg. The westbound rate from Pennsylvania brick industries to Central Freight Association territory is made by adding certain arbitraries to the rate from Pittsburg. Johnstown, Pa., for example, takes an arbitrary of 50 cents per ton above Pittsburg. Eastbound the Johnstown rate is 30 cents below the rate to Pittsburg.

The brick in question are all made from fire clay, which, when used for brick making, is composed of a kind of clay rock ground and mixed with soft clay, both of which are found in the same localities at numerous points in Ohio and Pennsylvania and at one or more places in New Jersey. All three kinds of brick are composed of the same material, and may be, and often are, burned at the same time in the same kiln. The hottest part of the kiln produces paving brick, the medium burned are building brick, and those layers subjected to least heat are fire brick. Under present rates and commercial and manufacturing conditions pertaining to brick manufactured in Pennsylvania, the percentage moving west is much larger than the percentage of Ohio brick moving east. The westbound movement of Pennsylvania brick is estimated at 40 per cent and the eastbound movement of Ohio brick is stated to be approximately 15 per cent. The various plants compete for the eastern and western trade.

The brick for each grade is generally the ordinary 9-inch brick of commerce, but paving brick for street use often take the block size, and fancy building brick may be much longer and wider but not so thick. But for the purposes of this report fire, building and paving brick may be taken as of the same size. The weight of each kind is 7 pounds or 3½ tons to the thousand. Shipments fill the car to the maximum load of 10 per cent above marked capacity. The carrier, therefore, renders exactly the same service whether fire, building or paving brick is shipped in carloads between the same points.

Complainant's fire brick ranges in value about as low as, if not lower than, its building or paving brick, taking all of its sales into account, but an extract from a report of the Geological Survey, put in evidence by the defense, shows that the general value of fire brick is somewhat in excess of the value of building brick, and that the latter slightly exceeds the value of the brick used for paving. In view of the policy of the defendants themselves in making the same rates for all kinds on westbound shipments, which practice also obtains in most instances throughout the central west and in shipments to the south, the difference in value can hardly be said to furnish a basis on which to predicate a difference in rates. The practice of invariably making different rates on the three classes of brick seems to be confined to shipments into and between points in Trunk Line territory, and to this there is the exception above noted from Pennsylvania railroad points in Pennsylvania to Buffalo-Rochester, N. Y., territory.

It is entirely practicable to use fire brick for cheap building purposes and building or paving brick for fire-brick use, and instances have occurred where one kind has been purchased or sold to be used instead of another kind, and where fire brick shipped as for building use have really been used as fire brick, thus evading payment of the higher rate. Although interchangeable, each is usually confined to the individual use indicated by the name.

It may be fairly said in conclusion that the carriers in this case show no sufficient justification whatsoever for discriminating between the three kinds of fire-clay brick involved in this proceeding. The brick themselves are so nearly alike in color that, being the same size and of the same weight, they are practically indistinguishable the one from the other. To make different rates on each of these brick is virtually to permit the shipper to declare which of the three rates he chooses to impose upon the freight. The receiving agent of the railroad, unless an expert in fire-clay brick, could not tell which of the three rates to impose upon any one of the three varieties, except by inquiring what use was to made of these brick. Aside from the difficulty in learning what use the brick were to be put to upon reaching their destination, we can not regard a classification as scientific, or a difference in rates as well based, which is altogether founded upon a distinction that has no transportation significance.

Moreover, such a differentiation, if permitted and extended throughout the various classes of freight handled by railroads, would lead to an almost

endless multiplication of rates, which could find no excuse save in the use which might be made of the article transported. One class of lumber of the same measurement and of the same value and of the same general appearance and of the same weight as another might be given a distinct and separate rate. And so with building stone and cement and steel in certain forms, and many other commodities which will readily suggest themselves. Classification must be based upon a real distinction from a transportation standpoint, and we can find no such distinction between these three classes of brick, which are made of the same material and come out of the same kiln, as justifies a difference in rates. To hold otherwise would be to promote false billing on the part of shippers, and to require the carriers, if they would avoid the penalty of the law, to make a practically impossible examination into the use to which each shipment of these brick was put.

We are not asked in this proceeding to determine what rate may be imposed as a reasonable one, and therefore shall leave this matter to be adjusted by the carriers, subject to review upon complaint by this commission.

It will be ordered that the fire brick, building brick and paving brick made of fire clay and here considered shall, as to the points herein involved and as to the defendant carriers, bear the same rate. Upon the foregoing report—

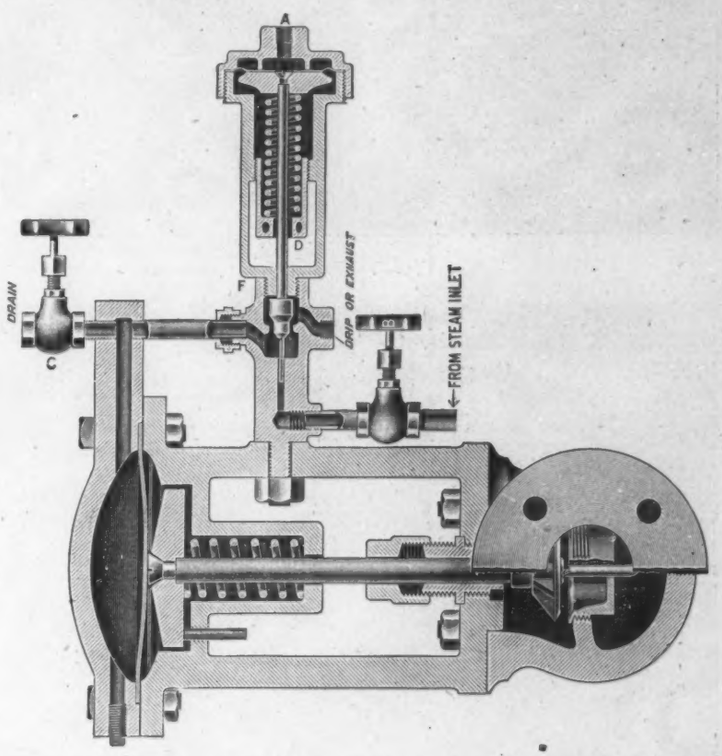
Order.

It is ordered, That the defendants, the Pennsylvania Co., the Pennsylvania Railroad Co., and the Baltimore & Orio Railroad Co., be, and they severally are, hereby notified and required to cease and desist, on or before the 15th day of August, 1907, and during a period of at least two years thereafter abstain, from their present practice of charging and enforcing rates, from Empire on the line of the defendant, the Pennsylvania Co., or Strasburg on the line of the defendant, the Baltimore & Ohio Railroad Co., or from other points on their lines in the state of Ohio, to points in the states of New York and Pennsylvania which, from any of said points of shipment to any of said destinations, are different for the transportation of fire brick, building brick and paving brick made from fire clay and of the ordinary 9-inch size known to commerce; and to publish and charge, on or before said 15th day of August, 1907, and during a period of at least two years thereafter, the same rates from each of said points of shipment to each of said points of destination on shipments of fire brick, building brick and paving brick described as aforesaid; and said defendants are hereby authorized to make said rates effective upon three days' notice to the public and the commission, given in the manner required by law, the tariff containing notation that it is issued under this authority.

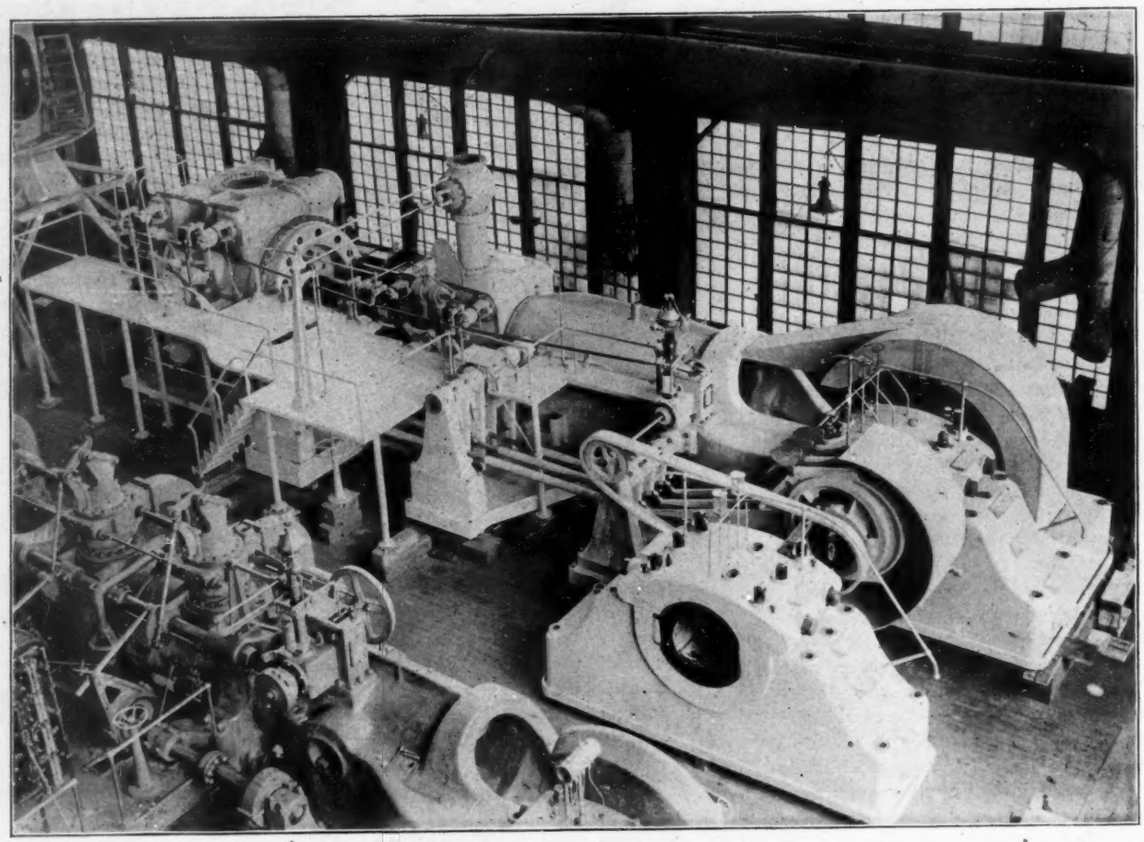
THE SQUIRES REDUCING VALVE AND PRESSURE REGULATOR.

The accompanying illustration shows the Squires reducing valve and pressure regulator, manufactured by the Strong, Carlisle & Hammond Co., 336 Frankfort avenue, N. W., Cleveland, which has been designed to meet conditions which have heretofore caused various troubles in the operation of steam plants. Superheated steam, on account of its dryness and high temperatures, draws the temper from springs and burns out rubber or metal diaphragms and leather dash cups. These faults are overcome in the present valve by the construction of the diaphragms, which are water sealed, and the location of springs so that steam does not come in contact with them. This permits the installation of this valve in any location regardless of temperature. An economical feature of this valve is that it has a by-pass within itself. Referring to the illustration, by closing valve B and opening valve C, the main valve is by-passed and retained wide open. Reduced pressure may be carried on the throttle valve, and all parts inspected, excepting the seat and disk while the line is in full operation. The valve and seat are removable and made of government bronze, giving an exceptionally long life to the valve. Full boiler pressure is available to close the main valve, thus insuring against sticking by corrosion and tightly packed stuffing boxes. The main valve is controlled by a pilot or auxiliary valve, acting independently of the initial pressure, which gives an absolutely accurately regulated pressure regardless of fluctuations in the initial pressure.

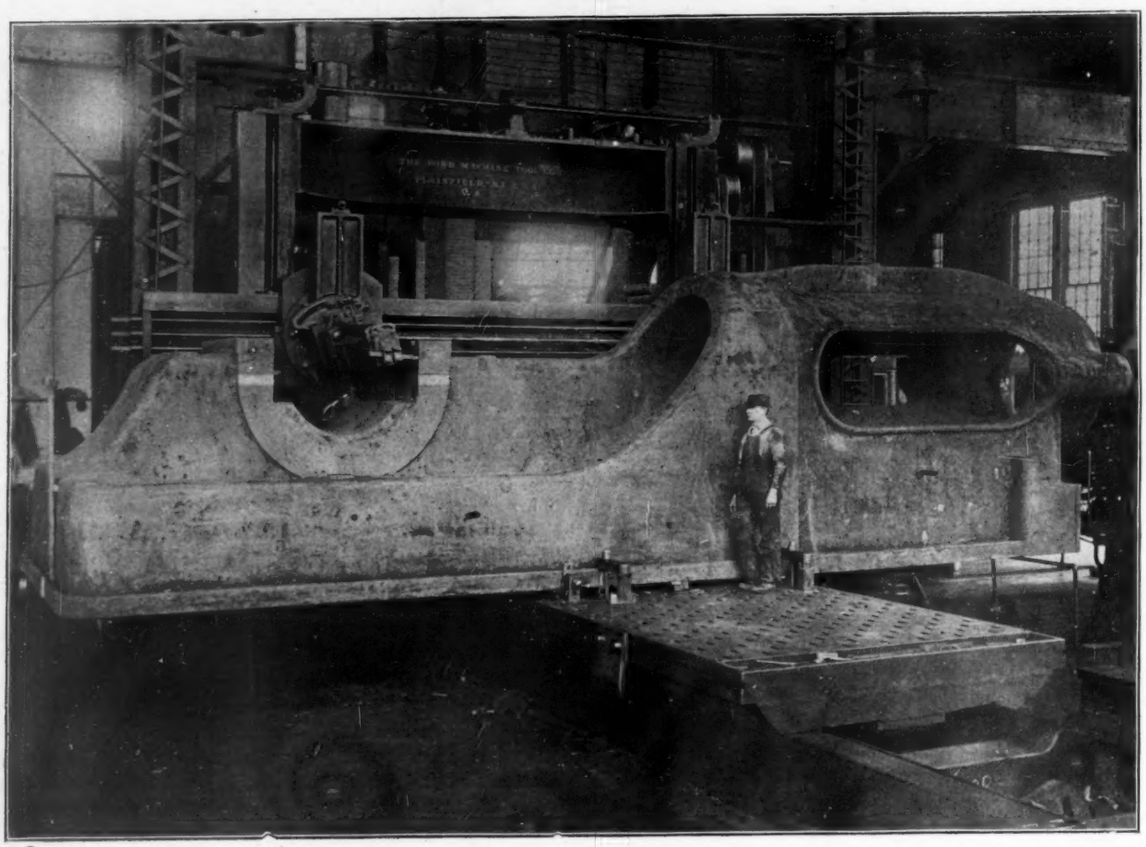
The behavior of this valve may be shown by the citation of the following test: A 5-inch valve was installed, the boiler pressure ranging from 90 to 145 pounds, the regulator being set for seven pounds. A recording pressure gage was installed in the line and it was found that the rise and fall in boiler pressure did not effect the reduced pressure in the slightest degree, the recording gage describing a perfect circle on the record sheet without varying from the 7-pound line. This same valve has been in use for a number of months, and is doing equally accurate work.



In installing the valve the steam line leading from valve B is piped to the high pressure side and point A to the regulated pressure side. The pressure on the diaphragm at A opens and closes the auxiliary valve, which controls the pressure upon the main diaphragm.



TOD TANDEM COMPOUND ENGINE FOR CARNEGIE STEEL CO.

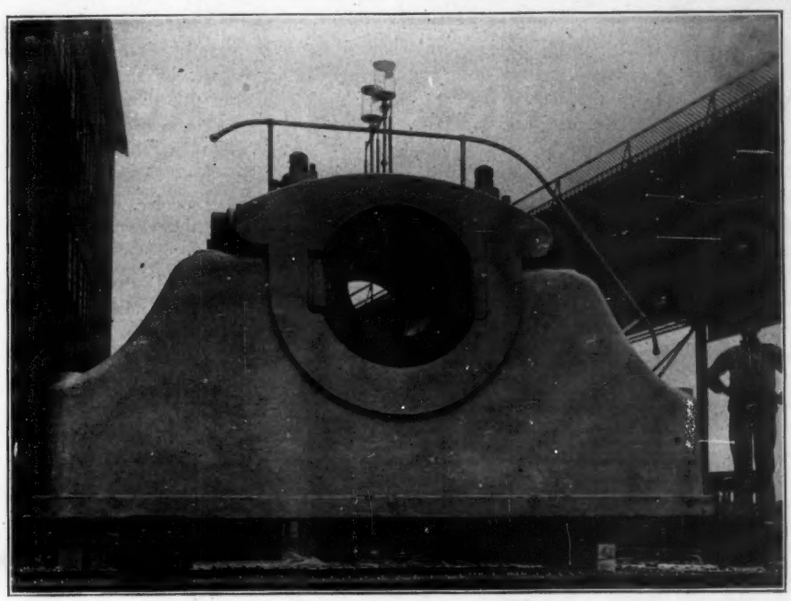


BED PLATE OF TOD ENGINE.

LARGE TOD ENGINE FOR THE CARNEGIE STEEL CO.

The accompanying illustrations show a noteworthy engine recently built by The William Tod Co., Youngstown, O., for the Carnegie Steel Co.'s Ohio Works at Youngstown. This engine is of the horizontal tandem type with steam cylinders 52 inch and 90 inch diameter by 60-inch stroke, and will be direct-connected to a 43 inch three-high blooming mill replacing a 45 inch by 12 inch Tod reversing engine driving a two-high blooming mill, which has been in continuous operation since 1894.

The engine is designed for a normal load of 4,000 indicated horsepower at 58 revolutions per minute, and will carry a maximum load of 7,000 indicated horsepower, which the builder stated to be the largest amount of power ever transmitted by a single crank pin.



Pillow Block of Tod Engine for Carnegie Steel Co.

Owing to the extreme variations in the load on the mill, a very heavy fly wheel is required, it being 24 feet diameter and weighing 240,000 pounds. The rim and arms are cast in halves and bolted between separate cast steel plate hubs. The arms are of I-beam section in order to obtain maximum strength and stiffness with minimum weight. The enormous load to be transmitted by the wheel will be appreciated when it is noted that while the ultimate capacity of the engine itself is about 7,000 horsepower, the operating conditions in the mill require that 14,000 horsepower be delivered for a short period of time when the ingot is making its first pass through the rolls. This requires that at least 7,000 horsepower be stored in the fly wheel during the idle passes and delivered again to the shaft at the time of maximum load.

The design of the engine shows some unusual features, the most noticeable of which is the arrangement of the steam cylinders; the high pressure cylinder being bolted directly to the main slides, while the low pressure cylinder is located behind the high and attached directly to the bed plate by means of two massive tie rods which run from the front head of the low pressure cylinder to lugs on the bed plate hood. Both cylinders rest upon a heavy sole plate, the front end of the low pressure cylinder being firmly bolted to it. Both cylinders being independently attached to the bed plate does away with the transmission of any strains from one cylinder through another, and leaves each cylinder free to expand.

The valve gear is of the "double-ported Corliss" type with forged steel hooks, and all other parts of unusual size and strength. The gear is driven by three eccentrics, one of which operates the steam valves of both cylinders; the other two being connected to the high pressure and low pressure exhaust valves respectively. The cut-off mechanism is of the "long range" type actuated by a special form of fly ball governor. The cylinders are equipped with auxiliary valves to enable the operator to handle the engine in either direction.

The engine is of such size that it has the unusual feature for a horizontal engine of an operating gallery giving access to the upper portions of the valve gear. The bed plate is of the "bored guide" type and weighs 90 tons. The back pillow block weighs 40 tons. The main journals are 30 inch diameter by 58 inches long, the shaft being 36 inches in diameter in the center. The crank pin is 20 inches x 16 inches, and the total weight of the engine is 1,000,000 pounds.

STEEL LIFT LOCK

Opened to Traffic at Kirkfield, Ont.—Among Canadian Industries.

(Special Correspondence.)

Toronto, July 15.—The lift lock at Kirkfield, Ont., on the Trent Valley canal, was opened on July 6 by Hon. Rodolphe Lemieux, postmaster general, in the presence of about 2,000 spectators. This makes the fifth hydraulic lock in operation in the world, the others being the Anderton lock in England; La Lienvier lock in Belgium, La Fontainette lock in France, and one at Peterborough, Ont., both Canadian locks having a capacity of 1,000 tons or double that of the locks in Europe. The Kirkfield lock is a large steel and concrete structure, containing two steel chambers, which are raised or depressed by hydraulic pressure. As one descends, the other ascends, the weight of the descending chamber raising the other. The height of the lift is 48 feet 6 inches. The central or guide tower, composed entirely of steel, is 94 feet high. Each of the chambers is 140 feet long by 33 feet wide and 9 feet 10 inches in depth, containing 8 feet of water, the approximate weight of which is 1,385 tons. Each chamber is supported in a steel ram 7 feet 6 inches in diameter, which works in a cylinder, the external diameter of which is 8 feet. The cost of the structure exclusive of concrete walls and breast walls was $298,000. The construction of the Kirkfield lock completes the last link in that section of the Trent valley canal which connects Lake Simcoe with the Kawcortha lakes in Victoria and Peterborough counties.

The Canadian government has let contracts for about $1,000,000 worth of rolling stock for the Intercolonial railway, including 22 locomotives to be built by the Kingston and the Montreal Locomotive Works, and a large number of freight cars, most of the orders for which went to the Crossen Car Co., Cobourg and Rhodes, Cewory & Co., Amherst, N. S.

The citizens of Sarnia, Ont., July 8 carried almost unanimously by-laws granting a free factory site and a bonus of $10,000 to the Standard Chain Co., Pittsburg, which will build a Canadian branch in the town; and the giving of a loan of $12,000 to be repaid in eight annual installments to the Jenks Dresser Bridge Co.

DIFFICULT PROBLEM SPLENDIDLY HANDLED

Office of THE IRON TRADE REVIEW,
411 Providence Bldg., Duluth, July 15.

Although the record breaking performances of the Duluth, Missabe & Northern railroad in hauling ore from the Mesabi range to the Duluth docks have excited attention and admiration because of the tonnage handled, the real significance of the accomplishment is little recognized because the real problem is little known. This carrier has a railroad problem entirely its own, a problem in which not only the railroad itself is interested but which concerns the vessel interests whose boats load at the Missabe docks and the furnace interests which use this ore. It is a unique problem with the Missabe road, not because the Great Northern and Duluth & Iron Range railroads never have to meet it, but because the mixing of the ore from the mines whose output the Missabe road handles, is a continuous operation and involves practically every car of ore shipped.

To illustrate concisely the extent to which this consideration enters in of so mixing the various ores from the different mines, that from the time the ore leaves the range till it is emptied into the dock, only 80 miles away, the ore from all the hundred or so shovels and numerous shafts shall have been classified into but five groups of guaranteed analysis from which analyses a variation of not more than a fraction of a per cent is allowed, the guarantee covering not only iron, but also phoshorus, silica and manganese, the following statement avails in a measure. There was shipped up to July 1 from the Duluth docks approximately 4,100,000 tons or allowing an average of 2,500 tons to the train, the contents of 1,640 trains. This is a conservative number of trains but something of the situation may be realized when of all that number scarcely a dozen trains have contained ore of such analysis as to permit of being run straight from the mines to the docks without being broken up for mixing. In the last month an average daily tonnage of over 80,000 has been shipped, practically all of which had to be manipulated.

The handling of the major portion of this mixing is directed from the office of the Oliver Iron Mining Co. at Hibbing. The considerations governing are hard and fast limitations. The railroad and mining operations must not be delayed, every cargo must meet one of five guaranteed analyses, and each boat to be loaded must have for a certain draught so many tons of ore. That all these requirements can be met continuously with absolute precision is readily seen to be impossible and because they cannot be is why the mines complain of lack of empties, the boats complain of delays and slow loading at the Duluth docks, and the furnaces complain that the ore they have received is off grade. A certain amount of complaint is probably necessary or at least expedient in keeping the wheels going at the present strenuous pace and in obtaining the best results possible but it is also to be remembered that the ore is as it is, and pig iron must be made from the ore as it is and not as we wish it might be.

To begin with the operator at Hibbing receives from the dock a 24-hour notice of the boats due to arrive in the next 24 hours, and the group or kind of ore they are coming after. This gives him an idea of the tonnage of the boats he has to fill and he begins to lay out or perhaps better build up in the dock what are called "blocks" of ore each block having a number. The dock agent keeps track of the various blocks noting the pockets in which they lie and so far as possible the blocks are not split up and put in separated portions of the dock. The boat cargoes are then made up of these blocks, a typical order for loading being, "load the Smith with block No. 307" or "load with blocks Nos. 570 and 502" or perhaps "load the Brown with block 387 and 500 tons of block No. 185." It is evident then that these blocks must have been so prepared that when loaded into the boat they constitute a cargo of the correct average analysis and of the given tonnage.

This can be made the more clear by turning to the work of the Hibbing office. When the loaded ore cars are hauled from the mine or shaft pocket to the mine siding a sample is taken from each ten cars and when a train is made up and started down toward Duluth the sample with the numbers of the cars from which it is taken is sent to the laboratory for analysis which analysis is then reported to the operating office at Hibbing. When the train reaches Keenan, a short distance down the road, the conductor telegraphs back his train report confirming the car numbers. A "train sheet" is then made out and the analysis placed opposite the groups of ten cars making up the train of from forty to fifty cars. From the analyses the tonnage of ore shipped is estimated and the separation into blocks is begun.

The principal distinction is of course between Bessemer and non-Bessemer ores, but it is also maintained with regard to iron, silica and manganese and the five groups are designed to cover these variations. Therefore, wherever the several parts of the train load are sufficiently different from each other in analysis to approach in character one group rather than another they are given a block number. That ore also which may be half way betwen two groups will be disposed in the same way. The ore left in the dock must also be renumbered and oftentimes the entire train is added to blocks already started in the dock, the added ore if both are off grade, being used to raise or lower the average analysis of the block.

Each cargo is considered as containing so many units of each element, the number of units depending on the group and the tonnage. Therefore, in building the blocks, the number of units each contains is first figured from the estimated weight while the train is enroute. When the train reaches Proctor and is actually weighed a correction is made and the necessary units added or subtracted, and as a result a certain block may have to be changed from one boat to another. As soon as the operator at Hibbing has the train "blocked out" he telegraphs to the transfer yards at Proctor his orders and the various blocks of ore are switched out and new trains made so that the ore can be dumped on the proper dock and proper place without any switching on the dock.

It is evident that the blocks must be as varied in size as the boats are in tonnage. No block must be allowed to run so far "off grade" in taking care of the ore coming down as to make it impossible of neutralizing without adding more ore than any boat would hold. There must also be provided what are called "balance blocks" which analyze "on grade" and with which a cargo almost completed may be finished where the blocks have not been quite sufficient. It is also evident that in every case the entire block must be taken by the boat since it is only the average analysis

which meets the group requirements and it may be that the few hundred tons of ore left may be just the ore required to bring the cargo to grade.

Thus it happens oftentimes that a 5,000-ton and a 10,000-ton boat may neither of them be able to load although there may be much more than their capacity of ore in the deck, simply because just the right combination of blocks cannot be obtained. For the same reason the larger boat may be able to load where the smaller one cannot. It also happens that one boat may take precedence for this reason of another arriving ahead of it, or in order to give each boat its turn the boat's orders may have to be changed from one group to the other.

How endless the opportunities are for delaying the boats a little and for shipping a cargo a little "off grade" may be easily appreciated. For instance a bad order car thrown out or the difference between the estimated weight and the actual weight as determined at Proctor may put into a cargo more or less ore of a certain grade than it should have without there being any time to prevent it, the distance from Proctor to the docks being but little more than five miles.

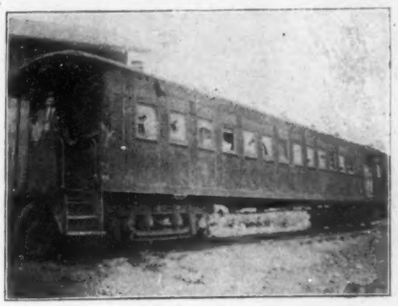
Adding to the problem has come the necessity for a more thorough mixing of the ore in the boats the present system accomplishing more of a mathematical mixture than a real physical mixture. It has been asked that instead of just dumping the ore into the boats as it comes, it be strewn layer by layer, alternating the different grades of ore, so that instead of the possibility of having all the high silica ore in one part of the hold and all of the low in another, an even distribution may be obtained. Plans are now on foot to bring this about and it means either taking more room in the dock for each with more shifting or the building of immense switching yards at Proctor where a train can be made up two or three cars at a time doing all the mixing before the ore gets to the dock. In either case the railroad has a tremendous problem on its hands and it is handling it in splendid fashion.

A STEEL CAR OF WAR TIMES.

On a sidetrack in Sharpsville, Pa., there stands what is undisputedly the first steel car ever constructed in this country if not in the world. The car was built during the days of the Civil war, when sharp-shooters and canister shot made railway traffic dangerous for even the public to say nothing of the soldiers doing battle on southern fields.

The car was built for the old Sharpsville railroad which has since been absorbed by the Pennsylvania system. After the war it was not considered of much use and consequently was shoved onto a sidetrack where the ravages of time have wrought considerable damage. The steel sides are rusted through in some places, while the car, generally, has a very much battered appearance.

The car stands eleven feet and eleven inches from the top of the rail and in appearance is very much similar to those now in use on the railroads, although not so elaborately furnished. It is divided into two compartments, one for passengers, with the seats running lengthwise of the coach, and another part for the baggage. Its total length is forty-eight feet and three and one-half inches. It is eight feet and



two and one-half inches wide. In place of the steel springs in use these days, however, the spring is secured from large pieces of rubber that have been placed in very much the same position as the present day steel springs.

Russian Agricultural Machines.—Consul-General Richard Guenther, of Frankfort, states that a general meeting of Russian manufacturers of agricultural machines was held last April in order to take steps for promoting their business interests. The German consul-general at St. Petersburg, in reporting on this meeting, says one of the resolutions adopted calls on the Russian government to order its "Department for placing settlers on public lands" to purchase only agricultural machines and implements of domestic manufacture. An official representing said department who was present at the meeting replied "that until now the Russian manufacturers had not turned out any machines that could be used or that were of as good quality as those of foreign make. When the Russian manufacturers would make perfect machines they would also get orders for them."

LAKE SUPERIOR MINING INSTITUTE.

Secretary Yungbluth, of the Lake Superior Mining Institute, has issued a circular stating that for the annual meeting to be held in Duluth, July 24 to 27, the Duluth, South Shore & Atlantic railway has granted a rate of one full fare for the round trip, on the certificate plan. The Chicago & Northwestern, the Chicago, Minneapolis & St. Paul and the Wisconsin Central railways have announced a rate of one and one-third fare for the round trip, this rate to be in force from all points in Wisconsin and the upper peninsula of Michigan; also from Chicago and intermediate points. Purchasers will request certificates from the agents. As the rate of fare in the state of Minnesota is now two cents per mile, no reduction has been made for this meeting. Purchasers will, however, secure certificates from agents. Members and their guests should arrange to reach Duluth not later than Wednesday, July 24, as a trip to the Great Northern Power Co.'s plant at Carlton is planned for 1:30 p. m. Headquarters will be at the Spalding hotel. The visit to the ranges will be on Thursday, Friday and Saturday, returning to Duluth in time to connect with the evening trains for southern and eastern points.

The following papers are announced for the meeting: Sampling of Iron Ores, by Prof. L. S. Austin, Houghton, Mich.; Biographical Sketches, by J. H. Hearding, Eveleth, Minn.; The Standard Boiler House of the Oliver Iron Mining Co., by A. M. Gow, Duluth, Minn. Spencer S. Rumsey, F. A. Cokefair and others will also present papers, the titles of which will be announced later.

The Stanley Works Co., New Britain, Conn., hardware manufacturer, has increased its capital stock from $1,500,000 to $3,000,000, which provides capital for one of the biggest power enterprise in Connecticut. It permits the company to transmit power from the town of Kent, in Litchfield county, to its plant in New Britain. This right has been brought by a resolution favorably reported to the state legislature, amending the charter of the company. The distance the power is to be carried is 40 miles, and can be used by the company only and for manufacturing purposes. The company intends building an immense plant on the Housatonic river. The power will be conveyed over high tension wires.

ORE DUST DECISION

May Compel Jones & Laughlin Steel Co. to Abandon Five Blast Furnaces.

The Jones & Laughlin Steel Co., of Pittsburg, received a severe set-back last week, when, on Friday, Judge James C. Young, of Common Pleas Court No. 2 declared the officers and directors of the steel company in contempt of court in failing to abate the ore dust nuisance at its Eliza furnaces, as directed by the court in April, 1904. A fine of $5,000 was imposed upon President B. F. Jones. William L. Jones, general manager, W. C. Moreland, secretary and treasurer, Harry S. Kiehl, W. W. Whitlock, James B. Laughlin, directors, and E. L. Messler, superintendent of the Eliza furnaces were also declared to be in contempt and were each fined $100.

The Eliza furnaces on Second avenue, Pittsburg, are adjacent to Oakland, a residence section of the city, and the case to compel the steel company to abate the dust nuisance was brought by E. R. Sullivan and his wife, owners of property in that district. The case has been appealed to the supreme court of Pennsylvania, and should the decision of Judge Young be sustained, it may be necessary for the Jones & Laughlin Steel Co. to abandon the five Eliza furnaces, which would mean a suspension of the immense steel plant on the South Side of Pittsburg, as the two plants are connected by a bridge over the Monongahela river and the furnaces supply the steel plant with its entire supply of hot metal.

President B. F. Jones, speaking of the decision, said: "Judge Young's decision is a very serious set-back to the Jones & Laughlin Steel Co. and means, if sustained by the supreme court, that we must give up the Eliza furnaces and that means the shutting down of the South Side plant."

The South Side plant is entirely dependent upon the furnaces for a supply of hot metal, and if this cannot be secured, the only alternative is to shut down the entire works. The steel company during the past few years has spent over a quarter of a million dollars experimenting in an effort to eliminate blast furnace dust, and has succeeded in reducing the volume about 80 per cent.

The decision, although the case has not been finally decided, has already had its effect upon other industries and residents of Avalon, a down river suburb of Pittsburg, are talking of beginning an action against the Neville Island furnace of the American Steel & Wire Co.

The decision in Judge Young's court perpetually enjoins the Jones & Laughlin Steel Co., "from such operation of its furnaces situated in the Fourteenth ward, Pittsburg, as to cause to be emitted therefrom clouds of ore dust, working and causing the injury to the property of the plaintiff." In the present proceeding, which was a rule for contempt, it is alleged that the company has daily and frequently, since the date of the decree, so operated its furnaces as to cause to be emitted therefrom clouds of ore dust, working and causing injury to the property of Sullivan and in open and deliberate violation of the terms of the decree. The company filed an answer admitting that ore dust was emitted but not in character, extent or effect as was enjoined by the decree of court and the answer also denied any contempt of court.

Upon this petition and answer much testimony was taken and this is commented on at considerable length in the opinion filed by Judge Young. This entire history of the case, from its beginning in 1904 up to the present, is also contained in the opinion. The court says:

We must conclude that the injury which it was intended to prevent by this decree under the words "working and causing injury to the property of the plaintiff" means the injury resulting from the casting out of ore dust upon complainants' property and that the effect is not only annoying, but injurious. From the admissions of the answer and the evidence we must conclude that ore dust does, from time to time, escape from Eliza furnace. We must also conclude that large quantities of ore dust escaped while experiments were being made in an effort to prevent the escape of the ore dust, but the evidence shows that, when the furnaces were being operated in the ordinary and usual way, there have been escapes of clouds of ore dust from the furnaces.

The evidence conclusively shows that the defendants have persistently and frequently, both day and night, so operated their four old furnaces and a fifth new furnace, since the granting of the injunction, as to cause clouds of dust to be emitted therefrom. The evidence also shows that the effect of the ore dust is not only annoying, but injurious to property.

A careful consideration of the evidence leads to the conclusion that the clouds are not so frequent and the quantities of dust escaping not so great. This is the sole defense.

The evidence in this case shows most conclusively that neither trouble nor expense has been spared by the defendants to prevent the escape of ore dust, and for this purpose $285,000 has been spent and, in addition the company has lost over $200,000 in shutting down furnaces to make experiments. We are satisfied that the defendants have made every effort to comply with the decree. It is insisted by counsel for the defendants that these efforts are conclusive evidence that the defendants have not violated the spirit of the decree, and therefore could not be attached for contempt. We cannot agree with the position that this is a good answer to the charge that the decree has been violated.

We have no discretion in deciding this question. The Appellate Court has decided the question and by its decree declared that these defendants should not do the things the evidence shows they are still doing. If they cannot obey the decree and operate their works, they must cease to operate them until they can obtain a modification of the decree.

THE BRUCE-MERIAM-ABBOTT CO.

The plant of the Bruce-Meriam-Abbott Co., Cleveland, is running to its full capacity. This firm has grown in six years from a small concern building 6 to 18-horsepower engines, to one now of large proportions, putting out engines from 12 to 250-horsepower. The gas engine for power purposes generally, especially for electric work, is fast coming into favor, owing to the low fuel cost.

Some of the recent sales made by this company are: The Salamanca Water & Light Co., Salamanca, N. Y., one 100-horsepower and two 125-horsepower natural gas engines; J. P. Eustis Mfg. Co., Boston, Mass., (ninth order) one 35-horsepower and one 80-horsepower producer gas engines; Kansas City *Journal*, Kansas City, Mo., one 125-horsepower natural gas engine; the City Machine Co., Cleveland, one 80-horsepower natural gas engine; the Medina Granite & Marble Co., Medina, Ohio, one 27-horsepower producer gas engine; the Rocksament Stone Co., Tuckahoe, N. Y., one 55-horsepower producer gas engine; the Day-Ward Co., Warren, Ohio, one 55-horsepower producer gas engine; L. T. Yoder, Pittsburg, Pa., (third order) one 80-horsepower natural gas engine; the Frewsburg Electric Light & Power Co., Frewsburg, N. Y., one 27-horsepower producer gas engine; Forest City Realty Co., Cleveland, O., one 35-horsepower natural gas engine; the Acme Machinery Co., Cleveland, one 100-horsepower natural gas engine; C. A. C. Axe Co., Holbrook, Mass., one 55-horsepower producer gas engine; M. E. Lamb, New Egypt, N. J., one 45-horsepower producer gas engine; Brown Folding Machine Co., Erie, Pa., one 35-horsepower natural gas engine; Dentists' Supply Co., York, Pa., one 80-horsepower producer gas engine.

Installing Gayley Blasts.—Gayley dry blast plants are under construction by Guest, Keen & Nettlefolds, Ltd., Cardiff, Great Britain, the Warwick Iron & Steel Co., Pottstown, Pa., and the E. and G. Brooke Iron Co., Birdsboro, Pa. These plants are rapidly approaching completion, and it is expected that they will be placed in operation during the present summer. Frank C. Roberts & Co., Philadelphia, are the engineers for these plants.

The output of the Dominion Iron & Steel Co. of Sydney, N. S., for June was as follows: Pig iron, 25,000 tons; steel ingots, 24,325 tons; blooms, 20,800 tons; rails, 7,400 tons; wire rods, 6,700 tons. This broke all previous records.

Upward Stock Movement is Checked

The mild upward movement that has prevailed in stocks for the previous fortnight received a setback during the past week, and reacting from the former tendency, prices declined generally and closed at lower levels. About one-half of the general gain made in the previous bull movement was lost, and hesitation is now apparent where confidence in the market's future state had formerly prevailed. However, there were several instances of substantial net gains being attained by industrials during the week, particularly New York Air Brake, which mounted 8¼ points. Among the causes to which the decline is attributed is the declaration of the impossibility of bulling prices without a willingness to buy stocks on the part of the general public, a factor that has been conspicuously absent from the market for months. The new program of government procedure against combinations in restraint of trade, as illustrated by the action against tobacco interests, has opened up new possibilities which will exercise much influence upon securities, it is believed. Abnormal conditions ruling in the call money market in the week brought about a stiffness in rates, which reached 8 per cent on Wednesday, but subsequently declined to a 4 per cent average. The withdrawal of $30,000,000 of government deposits came due on Wednesday and the date for payments on the Union Pacific and Atchison bond issues also fell within the week. The close of the market on Saturday displayed the greatest strength of the week, and this was due in part to the surprisingly good showing of the bank statement. An increase of $4,075,700 in cash holdings and a gain of $6,020,800 in the reserve surplus were shown, a condition that was almost the reverse of what had been expected on account of the government withdrawals and other drains upon the bank's cash. The change in the surplus reserve raised the amount held by the banks in excess of their requirements to $6,877,050, against $856,250 last week and $12,030,800 July 14, 1906. Loans decreased $10,888,400, against a reduction of $7,780,400 in deposits. The New York stock exchange during the week showed a larger volume of total transactions over the previous week, the figures being 3,081,400 and 2,311,500 shares respectively, against 3,037,290 shares the corresponding week last year. Some improvement was also shown by bonds, the total sales being $5,068,000, against $4,449,000 last week and $8,153,500 last year.

Copper Stocks.

Boston.—Butte Coalition, closed 25¼, net loss in week 2¼; Calumet & Arizona, closed 167, net loss 7; Calumet & Hecla Mining, closed 830; Green-Cananea, closed 16½, net loss ¾; Quincy Mining, 177⅞, net loss 1⅛; Osceola Mining closed 128, unchanged; North Butte Mining closed 83⅛, net loss 1½.

New York.—Amalgamated Copper, closed 89⅞, net loss 2⅜.

Financial Notes.

Based on the reports made to it, the *Wall Street Journal* estimates that the railroads of the United States have earned $2,578,413,273 gross in the fiscal year ended June 30, 1907, an increase of $258,653,243, or 11.15 per cent over the previous year, comparing with an increase of $237,277,624, or 11.4 per cent in 1906 over 1905. The net earnings of the fiscal year are estimated at $841,468,503, an increase of $53,871,626, or 6.84 per cent over the net earnings of the previous fiscal year, comparing with an increase of $96,329,141, or 13.9 per cent in 1906 over 1905.

Recent dividend declarations include the following: International Steam Pump Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable Aug. 1: Ralston Steel Car Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable Aug. 1; Buckeye Steel Casting Co., regular quarterly dividends of 1 per cent on the common stock and 1½ per cent on the preferred stock, payable Aug. 1; Railway Equipment Corporation, monthly dividend of 1½ per cent and an extra dividend of 2 per cent, payable July 15.

THE LEADING INDUSTRIAL SECURITIES.

	Clos'ng Quo. July 13	Changes in Week	Date 1907 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Paid	Dividend Date Last Div. Pay.
Allis-Chalmers	10⅞	— ⅛	Sept.	19,820,000		.....	.....
Allis-Chalmers pr	29¼	—1⅛		16,150,000	7 cum	.....	Feb., 1904
American Can	5⅛	— ⅛	Feb.	41,233,300		.....	.....
Am. Can pr	53½	—1⅛		41,233,300	7 cum	5 Q.	Apr., 1907
Am. Car and Fdy	44	— ⅜	June 27	30,000,000		2 Q.	Apr., 1907
Am. Car and Fdy pr	99½	— ⅜		30,000,000	7 n. c.	7 Q.	Apr., 1907
American Loc.	58½	—1	Oct. 5	25,000,000		1¾ Q.	May, 1907
American Loc. pr	105¼	+ ¾		24,100,000	7 cum	1¾ Q.	Apr., 1907
American Ship	70½	—7⅜	Oct. 2	7 600,000	6	1 Q.	June, 1907
American Ship pr	104½	— ⅛		7,900,000	7 n. c.	1¾ Q.	Jan , 1907
Am. Steel Foundries	7⅜	+ ⅛	Oct. 1	15,810,000		.....	.....
Am. Steel Foundries pr	40	+2⅜		17,240,000	6 cum	.....	Aug., 1904
Barney & Smith	65	.....	June 4	2,000,000	4	1 Q.	June, 1907
Barney & Smith pr	128½	.....		2,500 000	8 cum	2 Q.	June, 1907
Bethlehem Steel	14	— ⅛	April 2	14,862,000		.....	.....
Bethlehem Steel pr	40	.....		14,908,000	7 n. c.	1¾ Q.	May, 1907
Cambria Steel	37	—1⅜	March 19	45,000,000*	6	3 Q.	Feb., 1907
Cambria Iron	46	—1¾		8,468,000*	4	4 S. A.	Apr., 1907
Chicago Pneumatic Tool	40	—1	Feb. 18	6,145,800	4	4 Q.	Apr., 1907
Colorado Fuel	32⅛	—1¾	Oct. 21	30,132,000		.....	Apr., 1902
Crucible Steel	8	.....	Oct. 16	24,578,400		.....	.....
Crucible Steel pr	68½	.....		24,436,500	7 cum	6	Mar., 1907
Empire Steel	9	.....	Feb. 27	2,281,400		.....	.....
Empire Steel pr	57	—3		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100	.....	Feb. 19	1,000,000	6	1½ Q.	May, 1907
Fay & Egan pr	128½	.....		1,000,000	7 cum	1¾ Q.	May, 1907
General Electric	136¾	—2¾	May 14	63,643,600	8	2 Q.	July, 1907
Harbison-Walker	12	.....	Jan. 21	18,000,000	6	.....	.....
Harbison-Walker pr	73	.....		9,600,000	6 cum	6 Q.	Jan., 1907
International Pump	22½	—1¾	June 4	17,762,500		2	Apr., 1905
International Pump pr	72¾	+ ¾		11,350,000	6 cum	6 Q.	May, 1907
Lackawanna Steel	50	.....	March 13	34,971,400		.....	.....
Lake Sup. Corp.	8	— ½	Oct. 2	40,000 000		.....	.....
New York Air Brake	116	+8¼	June 18	10,000,000	8	8 Q.	Apr., 1907
Niles-Bement-Pond	130	.....	Feb. 6	5,000,000	6	6 Q.	Mar., 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	2 Q.	May, 1907
Otis Elevator Co	35	.....	March 18	6,350 300		3 A.	Apr., 1907
Otis Elevator Co. pr	88	+1		6,308,500	6 n. c.	1½ Q.	July, 1907
Penn. Steel	60	.....	May 13	10,750,000		.....	.....
Penn. Steel pr	100½	+ ½		16,500,000	7 n. c.	3½ S. A.	May, 1907
Pittsburg Coal Co	11⅜	+ ⅜	Feb. 11	32 000,000		.....	Nov., 1906
Pittsburg Coal pr	51⅝	— ¼		32,000,000	7	.....	Apr., 1905
Pressed Stl. Car	35	—2¼	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	90	.....		12,500,000	7 n. c.	1¾ Q.	May 1907
Pullman	160	.....	Oct. 17	100,000 000	8	2 Q.	May, 1907
Railway Stl. Spring	42	— ¾	March 7	13 500,000		4 S. A.	Mar., 1907
Railway Stl. Spring pr	89	.....		13,500,000	7 cum	1¾ Q.	June, 1907
Rep. Iron & Steel	28⅝	—1¼	Oct. 9	27,191,000		.....	.....
Rep. Iron & Steel pr	84	.....		20,416,500	7 cum	1¾ Q.	July, 1907
Sloss-Sheffield	57	—1	March 5	10,000,000	5	5 Q	June, 1907
Sloss-Sheffield pr	95½	—1⅞		6 700,000	7 n. c.	1¾ Q.	July, 1907
Tenn. Coal & Iron	142	.....	May 7	22,553,060	4	4 Q.	May, 1907
U. S. Pipe & Fdy	35	— ⅞	June 26	12,500,000	4	1 Q.	June, 1907
U. S. Pipe & Fdy. pr	80	.....		12,500,000	7 n. c.	1¾ Q.	June, 1907
U. S. Steel	37⅛	—1⅝	April 15	508,302 500	2 n. c.	½ Q.	July, 1907
U. S. Steel pr	100¼	— ⅛		360,281,100	7 cum	1¾ Q.	June, 1907
U. S. Steel 5's	96⅜	— ⅝		463,798 000	5	5 A.	.....
Va. Iron, Coal & Coke	66	.....	Sept. 17	8,641,600		.....	.....
Westinghouse Elec	144	+ ½	July 24	24 998,700*	10	10 Q.	Apr., 1907
Westinghouse Air Brake	145½	— ½	Oct. 1	11,000,000*		22½ Q.	Jan., 1907

Par value of shares, $100, except those starred (*), $50.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Leader Foundry Co., Quincy, Mo., capital $15,000, has been formed by Charles H. Achelpohl, J. H. Vanden Boom and Henry F. Dayton.

R. M. McGee, M. M. Christman and William M. Jones have organized the McGee Switch & Signal Co., Dallas, Tex., with a capital of $10,000.

The Scranton Standard Furnace Co., Scranton, Pa., has been incorporated with a capital of $100,000 to manufacture, sell and deal in stoves, ranges, etc.

The Jacobson Engine Co., Chester, Pa., capital $100,000, has been organized by Joshua C. Taylor, Charles Jacobson, Chester, and Robert E. Ross, Philadelphia.

The Faultless Stove Works, St. Charles, Ill., has been organized with a capitalization of $200,000 by Thomas Kilfeather, Walter H. Hoyt and George Mackay.

The Norfolk Iron Co., Norfolk, Va., capital $100,000, has been chartered by M. H. Logue, Youngstown, O.; W. D. Murray, Detroit, Mich., and G. W. Dusch, Wheeling, W. Va.

The Eureka Valve Co., Boston, valves and plumbers' specialties, capital $50,000, has been formed by Charles E. Chester, Boston, and George J. Thomas, Watertown.

The Turbine Pump Co., Oak Harbor, O., has been chartered with an authorized capital of $3,000 by John Duff, Clement J. Velliquette, Caroline Velliquette, M. F. Engler and H. L. Engler.

With an authorized capital of $100,000 the Lawton Flexible Harrow Co., Lawton, O., has been formed by Charles Mitschrich, Lawton; H. Z. McCowan, Snyder, O. T; and I. L. Haworth, Decatur, Ill.

William P. Champney, Robert Manning, George B. Shepard, William Austin and Charles A. Akers have incorporated the Cleveland Feed Water Regulator Co., Cleveland, with a capital of $10,000.

The Frontier File Co., Buffalo, N. Y., capital $10,000, has been formed to manufacture files and rasps by George E. Lattimer, William Samuel Johnson and John M. Hull, all of the above address.

The Baden & Alliquippa Bridge Co., Beaver, Pa., capital $5,000, has been organized by Joseph L. Holmes, Beaver; W. J. Mellon, Monaca; Edward D. Mellon, Baden, and Sarah J. Murphy, Wilkinsburg.

E. T. Lippert Saw Co., Millvale, Pa., has filed articles of incorporation with a capital of $100,000. Those interested are: E. B. W. Pfischner, F. J. Pfischner and E. T. Lipper, all of Millvale.

The Atlantic Machinery Co., Boston, has filed articles of incorporation with a capital of $20,000. The officers of the company are: President, Joseph H. Grogan, Brookline; treasurer, H. S. Crombie, Woburn.

Joseph E. Demar, 515 West 111th street; Richard Ely and Julian B. Beaty, 141 Broadway, all of New York, have incorporated the J. E. Demar Co., New York, to manufacture motors, engines, carriages, etc.

Articles of incorporation have been filed by the Reese Continuous Rail Co., Louisville, Ky., with a capital of $40,000. The incorporators are: John E. Reese, George L. Martin, W. T. Blackford and William Neal.

The Oil-Bath Lubricator Co., East Orange, N. J., machinery of all kinds, has been incorporated with a capital of $15,000 by George Isaksen, P. R. Bomeisler and Harry H. Peiking, all of the address given above.

The Roberts Co., Red Bank, N. J., mechanical engineer, machinist, etc., has been formed by E. Gerry Roberts, John M. Hoffmire Jr. and Edmund Wilson, all of the address given above. The company is capitalized at $100,000.

E. L. Kern, J. K. Neaglery and N. F. Miching have organized the Howell Car & Foundry Co., Trenton, N. J., with a capital of $100,000. The company will manufacture steam, electric and cable cars, maintain electric lines, etc.

The E. H. Jennings Bros. Co., Newark, N. J., iron, steel, coal, coke, etc., has been chartered with a capital of $5,000,000 by Edward A. Day, Morristown, N. J.; William T. Day, Elizabeth, N. J., and Jerome T. Congleton, Newark, N. J.

With an authorized capital of $3,000 the Rosengarten Bros., Nassau, N. Y., have been chartered to carry on a general business in the manufacture of iron by Albrecht C., Charles W. and Otto F. Rosengarten, all of the above address.

Articles of incorporation have been filed by the Log & Nawrath Co., Newark, N. J., capital $100,000, to manufacture machinery. Those interested are: Frank Loy and Robert Nawrath, Newark, N. J., and William F. Burditt Jr., Glen Ridge, N. J.

The Superior Oil Cup Co., New York, has been formed to manufacture oil cups, etc., by Irving S. Van Loon, 2424 Seventh avenue; William Phipps, 15 Crotona Park east; Zelah J. Van Loon, Park Avenue Hotel, all of New York. The capital stock of the company is $50,000.

The A. F. Murphy Die & Machine Co., Boston, machinery, etc., has been chartered with an authorized capital of $10,000. The officers of the company are: President, Irwin K. G. MacKenzie, South Boston, Mass.; treasurer, William Wilcox, Brighton, Mass.

The Deiller Faucet Co., New York, has been incorporated to manufacture faucets, pumps, valves, etc., with a capital of $125,000. The incorporators are: Eugene Deiller, Martin Deiller, R. Lee Smith, Newark, N. J.; George G. Hastings and Theron Davis, 170 Broadway, New York.

The Southern Stemming Machine & Mfg. Co., Washington, D. C., has been organized by G. Meredith Winship, 3130 Fourteenth street N. W.; John O. Morris, 742 Ninth street N. W., and G. Krogman, all of Washington; G. V. Pattison, H. W. Pentecost and L. E. Pentecost, of Guthrie, O. T.

The Wisconsin Ice Machine Co., Grand Rapids, Wis., has been organized by Frank Felbinger and O. C. Uehling, of Milwaukee, and A. E. Cafmeyer, of Chicago, to manufacture ice machines. Arrangements have been made with the Grand Rapids Foundry Co. to turn out the necessary parts.

The Lynchburg Mill Works, Lynchburg, Va., has been incorporated with a capital of $5,000 and will establish a plant for roll grinding, corrugating, etc. The officers of the company are: L. M. Clymer, president and treasurer; Hugh H. Clymer, vice president; Lacy D. Hines, secretary and manager.

The Breeze Carbureter Co., New York, has filed articles of incorporation with a capital of $5,000 to manufacture automobiles, motors, engines, etc. The incorporators are: Harry A. Robinson, Alyee M. Reynard and Isidore J. Reynard, 161 West Sixty-sixth street, New York.

The American Vertebrate Propeller Co., New York, capital $100,000, to manufacture propellers for ships, boats, etc., has been formed by Joseph Turner, Joseph Brecher, 40 West 116th street; Jean H. Riviere, 552 Seventh avenue, and Bert Bonner, 38

West 116th street, all of New York.

The International Kneader Co., Jersey City, N. J., has been chartered with an authorized capital of $500,000 to manufacture bakers' machinery and supplies. Those interested are: Adolph Mincke and Ernest Ruttkamp, 74 Congress street, Jersey City; Carl Stohm and James Plains, Boston, Mass.

The Graphoil Lubricator Co., Brooklyn, N. Y., capital $50,000, has been organized by Chester Comstock, Ridgewood, N. J.; Charles Leffler, 31 Jefferson street, and J. Judson Trappan, 335 Jefferson street, both of Brooklyn. The company will manufacture machinery, lubricators and machinery appertaining thereto.

The Automatic Packaging Co., New York, capital $250,000, has been formed to manufacture weighing and measuring machines, box making machinery, etc. The incorporators are: John Gorman, 116 West Twenty-third street; Louis Schulman, 583 Bedford avenue, and Joseph Schulman, 564 Bedford avenue, all of New York.

The American Link-Chain Belt Co., Jersey City, N. J., to manufacture detachable link-chain belts, etc., has been organized by Edward D. Cronin, 277 Vanderbilt avenue, Brooklyn, N. Y.; Fred Knowlton, 638 East 139th street, and Edgar A. Monfort, 1350 St. Nicholas avenue, both of New York. The capital stock of the company is $125,000.

Articles of incorporation have been filed by the Consolidated Lighting Co., Camden, N. J., to manufacture gas and oil machines for the production and supply of light, heat and power. The capital stock of the company is $100,000, and the incorporators are: William C. Harris, 1926 Girard avenue, Philadelphia; Theodore B. Fryer, Magnolia, N. J., and Winfield S. Caldwell, Beverly, N. J.

New Construction:—

The Rockford Machine Tool Co., Rockford, Ill., has begun work upon the construction of a new foundry 40 x 200 feet.

The General Electric Co., Lynn, Mass., is erecting a three-story brick and steel factory 80 x 450 feet. The construction contracts have been awarded.

The Iowa Malleable Iron Co., Fairfield, Ia., has decided to erect a new warehouse and an addition 60 x 106 feet to its foundry.

The McMyler Mfg. Co., Warren, O., is increasing its capacity by the construction of a foundry 100 x 100 feet and the making of other improvements to its plant.

The Menefee Foundry Co., Ft. Wayne, Ind., is erecting an addition 65 x 70 feet of cement block to its plant. Increasing business has made the improvement imperative.

The Centaur Wire & Iron Works, Des Moines, Ia., is building an addition 100 feet in length to its plant to accommodate its increasing patronage in fire escapes and other light structural work.

The carpenter work for the rolling mill of the Bristol Brass Co., East Bristol, Conn., has been let to W. E. Fogg, of Bristol. The plant includes a one-story building 75 x 210 feet, and one-story building 75 x 75 feet, both of reinforced concrete.

The Ohio Malleable Iron Co., Columbus, O., is making extensive improvements including a new building and the installing of several new furnaces. The company is controlled by the Jeffrey Mfg. Co., by which the greater part of its output is used.

The Virginia Foundry & Machine Co., Virginia, Minn., is having plans drawn for the construction of a building 40 x 130 feet, which will be used for a foundry, machine and blacksmith shop. The increasing business of the foundry has necessitated the extension.

The Flour City Ornamental Iron Works, Minneapolis, Minn., has awarded the contract to J. L. Robinson, of that city, for the erection of its new brick and steel foundry building 75 x 200 feet, which when completed will entail an expenditure of $125,000.

The Canton Boiler & Engineering Co., Canton, O., manufacturer of all kinds of light and heavy steel plate construction, reports that its recent increase of capital was to provide for improvements to its plant, including the addition of a steel building 50 x 150 feet, equipped with an electric traveling crane and other additional machinery which will increase the capacity of the plant as well as improve the facilities for getting out the work at less cost.

The Portsmouth Machine & Casting Co., Portsmouth, O., successor to Simpson Bros. and to the Portsmouth Foundry and Machine Works, is now remodeling the plant of the latter, which it has purchased, and reports that it will have some free capacity for any machine work and for any castings running under 10 tons in weight per piece. The company states that it can take good care of any patrons in the month of August. The plant of the Portsmouth Foundry & Machine Works, which has been acquired, is very extensive, occupying four squares. L. C. Turley is president of the new company.

General Industrial Notes:—

The Midland Iron Works Co., Racine, Wis., has increased its capital stock from $25,000 to $30,000.

The G. A. Kelly Plow Co., Longview, Tex., has authorized an increase in its capital from $50,000 to $100,000.

The Marion Foundry & Machine Co. has filed notice with the secretary of state of Ohio of a change of location from Edison, O., to Marion, O.

The Bay View Foundry Co., Sandusky, O., has increased its capital stock from $10,000 to $40,000. Adam W. Link is president and James M. Crane secretary.

Geo. D. Walcott & Son, Jackson, Mich., manufacturers of lathes and machines, now have a capital of $100,000, an increase from $60,000 having been made to provide for extensions to the business.

The Ramsey-Smith Co., Youngstown, O., recently formed for the purpose of solidifying flue dust, has organized by the election of S. W. Ramsey, president; B. F. Ramsey, vice president, and G. W. Smith, secretary.

The Joseph Schonthal Iron Co., Columbus, O., is installing a large amount of new machinery in its scrap yards. When the machinery is in operation, the company will have one of the best equipped scrap yards in the country.

The Southern Mfg. & Supply Co. is the name of a new enterprise which is being organized at Albany, Ga., to carry on a modern machine shop business. B. S. Coop, M. A. Jarrard and M. L. Markham are among those interested.

The stockholders of the Moline Foundry Co., Moline, Ill., have authorized an increase in capital from $10,000 to $15,000. E. H. Putnam, formerly with the Moline Plow Co. and later with the Moline Elevator Co., has taken an interest in the company and has become actively associated with the business.

The Chain Belt Co., Milwaukee, of which Fred W. Sivyer, president of the Northwestern Malleable Iron Co., is vice president, has increased its capital from $50,000 to $500,000. The Chain Belt Co. will absorb the Levalley Mfg. Co., manufacturer of steel castings. Several large additions to the plant are to be made.

The Mitchell & Van Meter Co., Linfield, Pa., manufacturer of plumbers' brass and iron material, states

that the recent fire at its plant was confined entirely to a small frame building used for storing oils and inflammable material and located a considerable distance from the main buildings. The loss was slight as the remainder of the plant was not damaged.

The increase from $112,000 to $250,000 in the capital stock of the Columbus Machine Co., Columbus, O., takes the form of 6 per cent preferred stock. Outstanding indebtedness and a rapidly increasing business are to be taken care of by the proceeds from the sale of the new stock. The company is now making a specialty of the manufacture of a gas engine and a pipe threading machine.

The control of the stock of the Harrisburg Mfg. & Boiler Co., Harrisburg, Pa., has passed to the Pelton Water Wheel Co., San Francisco, manufacturer of water and power wheels. The new officers of the company are: S. F. Dunkel, Harrisburg, president and manager; E. Brayton, San Francisco, vice president; J. B. Kunze, treasurer, and C. S. Creider, Harrisburg, secretary.

The stockholders of the Direct Drive Axle Co., Columbus, O., at their annual meeting elected W. E. Campbell, C. O. Haines, I. H. Pleukharp, C. T. Phillips, J. A. Kidwell, B. J. Gwynne and R. V. Marto as directors. The board organized by electing W. E. Campbell, president; R. V. Barto, vice president; I. H. Pleukharp, chief engineer; C. O. Haines, treasurer, and B. J. Gwynne, secretary.

The Dutcher Mfg. Co., Milwaukee, is soon to occupy three additions to its factory, the construction of which was begun some months ago. They comprise an addition to the molding room 64 x 70 feet, an addition 38 x 60 feet to the power house and a cleaning room 40 x 48 feet. A 10-ton furnace is also being put in and the motive power will be increased, enabling the company to double its present output.

The A. E. Shorthill Co., Marshalltown, Ia., manufacturer of structural iron and steel, boilers, engines, steam fittings, etc., states that the recent increase in its capital stock was authorized to cover undivided profits and real estate holdings, accruing since the original incorporation. The company has in contemplation some improvements to its plant for next spring. C. R. Speers is president and treasurer.

At th annual meeting of the stockholders of the Hayden-Corbett Chain Co., Columbus, O., W. C. Brown was elected president; W. H. Andrews, vice president; W. H. Hayden, secretary, and John T. Corbett, general manager. The executive committee is composed of J. D. Price, W. H. Andrews and John T. Corbett. The report showed the volume of business during the past year to have been the largest in the history of the company.

The Weimer Chain & Iron Co., Lebanon, Pa., recently incorporated, reports that for the present it will manufacture high-grade hand-made chains. All the company's buildings have been erected and the machinery placed. Sufficient orders are booked to insure full operation of the plant for a considerable length of time. The officers are: Edgar A. Weimer, president; Asa A. Weimer, vice president and treasurer, and George E. Holly, secretary and general manager.

The Cooper Heater Co., Dayton, O., recently incorporated with a capital of $100,000, is refitting the plant formerly operated by the Craig-Reynolds Co., in that city, for the manufacture of house and car hot water and steam heaters. The officers of the company are: President, J. D. Hunter, New Orleans; first vice president, George D. Cooper, St. Johns, Mich.; second vice president, R. F. Martin, Crowley, La.; secretary-treasurer, Edward Martin, New Orleans; general manager, W. L. Blackwell, Dayton.

Henry B. Haigh and John MacCormick have resigned as president and second vice president respectively, of the Engineer Co., New York, and their interests have been absorbed by Embury McLean, who has become president of the concern. Mr. MacCormick will engage independently in the manufacture of his stoker, the Engineer Co. having relinquished to him its rights in his patents. The change relieves the Engineer Co. of the commercial development of a stoker and gives it a free field for the installation of "balanced draft" in connection with any boiler furnaces whether hand fired or operated with various mechanical stokers. The present officers of the company are: Embury McLean, president; John C. Quinn, vice president; North McLean, treasurer, and R. E. Fox Jr., secretary and manager of sales department. The new board of directors includes the officers, J. F. Tapley, R. M. Searle and George Davies.

Trade Notes:—

The United Verde Copper Co. has installed in its Jerome, Ariz., plant a 50-ton, 4-motor overhead electric traveling crane. This crane has a 50-ton main hoist and a 5-ton auxiliary hoist, and was furnished by the Northern Engineering Works, Detroit, Mich. A 3-motor special extension electric traveling Northern crane has been added to the plant of the Weir Frog Co., Cincinnati.

William B. Phillips, metallurgist and chemical engineer, has removed his office to 209 Hood building, Birmingham, Ala.

Robert W. Hunt & Co., with general offices at 1121 Rookery building, Chicago, have been given the inspection of the material for the Southern Pacific Co.'s rifled pipe line. This embraces 256 miles of 8-inch rifled pipe, which is being manufactured at the Lorain plant of the National Tube Co., and the machinery for 24 pumping stations, covering 46 duplicate pumps to be manufactured by the Janesville Iron Works, Hazleton, Pa., and 72 boilers to be furnished by the Edgemoor Iron Co., Edgemoor, Del.

Fires:—

The plant of the American Steel Scraper Co., Sidney, O., was heavily damaged by fire July 9.

Fire in the foundry of the J. W. Penney & Sons Co., Mechanics Falls, Me., caused a loss of $1,000, June 26.

The machinery building of the McDonald Bros. Scale Co., Pleasant Hill, Mo., was damaged by fire July 4. Insurance is ample.

The plant of the Cream City Woven Wire Co., Allegheny, Pa., suffered a severe loss by fire July 10, estimated at $50,000. The machine shop of B. A. Gausman was also considerably damaged.

The collapse of the concrete building under construction at the plant of the Bridgman Bros. Co., Philadelphia, manufacturer of steam fitters' supplies, July 10, caused the death of three men and considerable damage to the construction work.

Change in Management.—Beginning with July, 1907, *Compressed Air* will be published by the Compressed Air Magazine Co., with offices at 11 Broadway, New York, instead of by the Kobbe Co., as heretofore. W. L. Saunders remains as editor; Frank Richards succeeds W. R. Hulbert as managing editor. Mr. Richards for ten years was one of the editors of *The American Machinist,* and previous to that time was connected with the Ingersoll-Sargent Drill Co. as superintendent of the shops.